

NPS ARCHIVE
1964
DREESE, R.

AN INVESTIGATION OF THE VALIDITY OF THE
GRADUATE RECORD EXAMINATION AND CERTAIN
PERSONALITY OR INTEREST TESTS IN PREDICTING
ACADEMIC PERFORMANCE IN THE MANAGEMENT
CURRICULUM OF THE UNITED STATES NAVAL
POSTGRADUATE SCHOOL

RICHARD M. DREESE
WILLIAM M. RUSSELL

LIBRARY
U.S. NAVAL POSTGRADUATE SCHOOL
MONTEREY, CALIFORNIA

AN INVESTIGATION OF THE VALIDITY OF THE GRADUATE RECORD EXAMINATION
AND CERTAIN PERSONALITY OR INTEREST TESTS IN PREDICTING ACADEMIC
PERFORMANCE IN THE MANAGEMENT CURRICULUM OF THE UNITED STATES NAVAL
POSTGRADUATE SCHOOL

* * * * *

Richard N. Dreese

and

William M. Russell

AN INVESTIGATION OF THE VALIDITY OF THE GRADUATE RECORD EXAMINATION
AND CERTAIN PERSONALITY OR INTEREST TESTS IN PREDICTING ACADEMIC
PERFORMANCE IN THE MANAGEMENT CURRICULUM OF THE UNITED STATES NAVAL
POSTGRADUATE SCHOOL

by

Richard N. Dreese

Lieutenant Commander, Supply Corps

United States Navy

and

William M. Russell

Commander, Line-Aviation

United States Navy

Submitted in fulfillment of the

requirements of the course

INDIVIDUAL RESEARCH

MN 400

United States Naval Postgraduate School
Monterey, California

1 9 6 4

MPS 1-10 10

10.10.10

10.10.10

AN INVESTIGATION OF THE VALIDITY OF THE GRADUATE RECORD EXAMINATION
AND CERTAIN PERSONALITY OR INTEREST TESTS IN PREDICTING ACADEMIC
PERFORMANCE IN THE MANAGEMENT CURRICULUM OF THE UNITED STATES NAVAL
POSTGRADUATE SCHOOL

by

Richard N. Dreese

and

William M. Russell

This work is accepted as fulfilling

the requirements of the course

INDIVIDUAL RESEARCH

MN 400

United States Naval Postgraduate School

ABSTRACT

Certain aptitude and personality tests were given to the 1964 Management Curriculum military officer students of the U. S. Naval Postgraduate School and the scores were correlated with the academic grades received during the first three terms. The results obtained confirm that the Graduate Record Examination is an excellent predictor of academic performance and indicate that neither the Structured Objective Rorschach Test or Allport-Vernon-Lindzey Study of Values are useful predictors of academic performance in the Management Curriculum. It is recommended that the Graduate Record Examination be administered to candidates for the Management Curriculum and that Selection Boards be advised of the results to assist in student selection for future classes.

TABLE OF CONTENTS

Chapter	Title	Page
I.	STATEMENT OF THE PROBLEM.....	1
	The Problem.....	1
	Definition of Key Terms	1
	Aptitude Tests	1
	Personality Tests	1
	Quality Point Rating (QPR).....	1
	Master's Level Academic Performance	2
	Graduate Record Examination (GRE)	2
	Structured Objective Rorschach Text (SORT)	2
	"Study of Values"	2
	Local Questionnaire	2
	- Correlation Coefficient	2
	- Reliability Coefficient	3
	- Confidence Level	3
	Assumptions	4
	Limitations	4
	Research Significance	4
II.	DESCRIPTION OF INSTRUMENTS	5
	Graduate Record Examination-GRE (Aptitude)	5
	Structured-Objective Rorschach Test - SORT	6
	Rorschach Variable Scores.....	6
	Study of Values	8
	Local Questionnaire	9
III.	METHODS, TECHNIQUES, AND PROCEDURES	10
	General	10
	Correlation Analysis	11
	Confidence Limits	12
	Regression Analysis	12
IV.	RESULTS OF THE STUDY	14
	General	14
	Test and Questionnaire Results	14
	Graduate Record Examination (GRE).....	14
	Structured Objective Rorschach Test (SORT).....	15
	Allport-Vernon-Lindzey Study of Values (AVL).....	18
	Local Questionnaire	20
	Correlation Analysis	21
	Confidence Limits.....	22
	Regression Analysis	22
	Comparison With Prior Years	23
V.	CONCLUSIONS AND RECOMMENDATIONS	29
	Conclusions	29
	Recommendations.....	29
	BIBLIOGRAPHY	30
	APPENDICES	32

List of Tables

Table		Page
I	Management Curriculum Students' Ranks, Designators and Military Components	10
II	Mean Scores on Graduate Record Examination	15
III	Distribution of Scores on 24 SORT Personality Traits	16
IV	Mean Scores on 15 SORT Scoring Variables	17
V	Distribution of Naval Officer Response to AVL Study of Values Interest Areas	19
VI	Comparative Mean Scores on AVL Study of Values	19
VII	Coefficients of Linear Correlation Between 24 Test Scores and Third Term QPRs	21
VIII	Confidence Limits GRE/QPR Correlation Coefficients	22
IX	Results of Using a Cut-off Score of 500 on the GRE(A)	24
X	Summary of Means and Standard Deviations of All Variables Included in the Study	27
XI	Intercorrelation Coefficients for All Variables Included in the Study	28

List of Illustrations

Figure		Page
1	Line of Regression Based on 1962 Class	25
2	Line of Regression Based on 1963 Class	25
3	Line of Regression Based on 1964 Class	26
4	Comparison of Lines of Regression 1962, 1963, and 1964 Classes	26

CHAPTER I

STATEMENT OF THE PROBLEM

During the preceding three years, studies have been conducted dealing with coefficients of correlation derived by comparing certain aptitude test scores with academic performance of the students in the Management Curriculum at the U. S. Naval Postgraduate School, Monterey, California. This paper may be considered as the fourth in the series of these correlation studies.

I. THE PROBLEM

This research study was undertaken to assess the characteristics of the 1964 Management Curriculum class by means of certain aptitude and personality tests and to determine if these tests offer a means of improving the selection of candidates for the Management Curriculum.

II. DEFINITION OF KEY TERMS

Aptitude Tests are tests which are designed to predict ability to learn in a specific area.

Personality Tests are tests which attempt to assess an individual's basic interests or personality characteristics.

Quality Point Rating (QPR) refers to a student's weighted grade score computed from standards established by the Naval Postgraduate School Staff as follows:

<u>Performance</u>	<u>Grade</u>	<u>Quality Point Number</u>
Excellent	A	3.0
Good	B	2.0
Fair	C	1.0

Barely Passing	D	0.0
Failure	X	-1.0

Multiplying the term hour value of a course by the quality point number received provides the total quality points for that course. Adding the quality points for all courses and dividing by the total number of credit hours results in a figure defined as the quality point rating. For example, if a student received four hours of A and four hours of B, his quality point rating would be 2.50 $(4 \times 3 + 4 \times 2) \div 8 \text{ hours}$.

Master's Level Academic Performance. To be eligible for a degree of Master of Science in Management, a student must attain a minimum average QPR of 2.00 in postgraduate level courses.

Graduate Record Examination (GRE) is a nationally accepted paper and pencil aptitude test designed to predict academic potential at the graduate level.

Structured Objective Rorschach Test (SORT) is a forced response paper and pencil projective ink blot personality test which is designed to appraise vocationally significant temperament traits.

AVL - Study of Values is a paper and pencil personality test which is designed to measure the relative prominence of six basic interests.

Local Questionnaire is a questionnaire which was formulated by the authors of this paper for the purpose of ascertaining the general interest of Management students in the curriculum both before and after commencing the course.

Correlation Coefficient is a measure of the degree of relationship between two or more variables, or, in other words, the degree to which variables or measures vary together. Mathematically, the value may

range from a perfect positive correlation (+1.0) through no relationship (0.0) to a perfect negative correlation (-1.0). When correlating variables, the coefficients indicate roughly the following strengths of relationships between the variables:

Less than .20Slight, almost negligible relationship

.20 - .40Low correlation, definite but slight relationship

.40 - .70Moderate correlation, substantial relationship

.70 - .90High correlation, marked relationship

.90 - 1.00Very high correlation, very dependable relationship

Those who employ tests in guidance and selection consider that a correlation coefficient should be at least .45 for material usefulness and that best results are obtained when the coefficient is above .60¹.

Reliability Coefficient is a measure of the repeatability of the test results. It is obtained by correlating the test with itself to determine the degree of similarity of results if the test is retaken in the same or alternate form or by splitting the test into halves. A reliability coefficient of at least .80 is desirable for a test to be considered reliable².

Confidence Level as used in this paper is 95 percent and is the probability that the true correlation coefficient for the entire population lies within a given range.

¹J. P. Guilford, Fundamental Statistics in Psychology and Education (first edition New York and London: McGraw-Hill Book Company, Inc., 1942), p. 219)

²Ibid.

III. ASSUMPTIONS

The acceptance of standard statistical methods of computing correlation coefficients, confidence limits and lines of regression is assumed.

IV. LIMITATIONS

This study is limited to the analysis of course grades through the first three terms of the four term 1963-1964 Management Curriculum because of time limitations. Historically the grades during the third and fourth terms have been higher than those of the first and second terms and this trend is in evidence at the end of the third term. Therefore, it is expected that the final QPR's will be somewhat higher than those reported in this paper.

The practice of alphabetical grade assignment provides a comparatively coarse indication of student performance. For instance, there is far less difference between A- and B+ levels of performance than between A+ and B- levels of performance, yet the grade assignment would be A and B in both instances. This results in some distortion in the QPRs generated.

V. RESEARCH SIGNIFICANCE

This study differs from the three which were done previously in that it attempts to determine if there exist any significant correlations between academic performance and interests or personality characteristics of Management Curriculum students.

CHAPTER II

DESCRIPTION OF INSTRUMENTS

I. GRADUATE RECORD EXAMINATION-GRE (APTITUDE)

This test is prepared by the Educational Testing Service of Princeton, New Jersey, and is widely used throughout the United States to determine student aptitude for postgraduate study. It yields two scores: verbal ability and quantitative ability. Included in the test are verbal reasoning questions, reading comprehension questions, and various kinds of mathematical problems involving arithmetic reasoning, algebra, and the interpretation of graphs, diagrams, and descriptive data.

The table of norms for the GRE (Aptitude) indicates that for 3,035 college seniors the Verbal Ability Test produced a mean score of 492 with a standard deviation of 98. The Quantitative Ability Test had a mean score of 480 and a standard deviation of 94. Established reliabilities for the test are as follows:*

<u>Test</u>	<u>Reliability Coefficient</u>
Verbal	.90
Quantitative	.84

*Score Interpretation Handbook

The GRE is a secure test which is lent to using agencies to be administered under controlled conditions. The GRE (Aptitude) requires a total working time of 2-1/2 hours. All Management Curriculum students completed the aptitude section of the GRE the week prior to the beginning of the School year.

II. STRUCTURED-OBJECTIVE RORSCHACH TEST-SORT

This is a personality test prepared by the California Test Bureau of Los Angeles, California. The SORT is similar to the traditional unstructured Rorschach projective ink blot test in that: (1) the ten original stimulus blots are used; and (2) the same scoring system of area, determinants, and content is employed. However it differs from the traditional Rorschach in that: (1) it is not intended for clinical use but rather as an instrument for assessing temperament tendencies or personality traits; (2) the stimulus responses are provided to the examinee, making the element of suggestion of response an integral part of the test; (3) the total number of responses is fixed, permitting stencil scoring of the answer sheets; and (4) no inquiry of examinee responses is conducted, obviating the need for a trained psychologist.

The scores are obtained from items grouped together in triads to which the examinee responds by choosing the one item of the triad which he perceives to be representative of the ink blot or some part of the blot. The scores obtained from the SORT are grouped according to standard Rorschach scoring techniques. The test produces 15 basic scores which are grouped into four classes as follows:

RORSCHACH VARIABLE SCORES

Responses to Blot Area

- (1) whole blot (W)
- (2) major blot details (D)
- (3) minor blot details (Dd)
- (4) white space (S)

Determinant Factors

- (5) responses closely resembling the form of the stimulus (F)
- (6) responses poorly resembling the form of the stimulus (F-)
- (7) responses involving human movement or posture-tension (M)
- (8) responses involving animal movement or posture-tension (FM)
- (9) responses involving color and closely resembling the form of the stimulus (FC)
- (10) responses involving color and poorly resembling the form of the stimulus (CF)
- (11) responses involving textural density of gray or shading (Fch)

Content Factors

- (12) responses involving whole animals or parts of animals (A)
- (13) responses involving total human figure or parts of humans (H)

Statistically Derived Scores

- (14) modal responses (P)
- (15) rare responses (O)

From these 15 scores, an assessment of 24 different personality traits is derived. A description of the personality traits, which the test purports to measure, was taken from the test manual³ and is included as Appendix C.

The population on which the SORT norms are based numbers 8,061 adults. Two test-retest studies of the reliability of the 15 variable scores are reported in the test manual. The subjects for these studies were 79 college students and 94 industrial supervisors; the time between administrations

³Joics B. Stone, S-O Rorschach Test Manual (preliminary edition; Los Angeles: California Test Bureau, 1958, pp. 15-16.)

was one week. The resulting reliability coefficients were as follows:

<u>Subjects</u>	<u>Reliability</u> <u>Coefficient Range</u> <u>for 15 Scores</u>	<u>Median</u>
College Students (N = 79)	.62 to .90	.75
Industrial Supervisors (N=94)	.61 to .84	.76

The test manual reports three concurrent validity studies of the SORT involving more than 4,000 individuals. The 15 scores were variously found to yield meaningful correlations with industrial employee ratings and with grade point averages of college freshmen. In one study involving 70 subjects, the supervisory ratings and SORT scores were found to be within nine points of agreement on a 100 point scale, 71 percent of the time.

The SORT takes approximately 30 minutes to administer. It was given to All Management Curriculum students during a regularly scheduled class period during the third term.

III. AVL-STUDY OF VALUES

This is a personality or interest test distributed by the Houghlin Mifflin Company of Boston, Massachusetts. It is designed to measure the relative prominence of six basic interests or motives in personality: theoretical, economic, aesthetic, social, political, and religious. The classification is based directly upon Edward Spanger's Types of Men⁴. A more complete description of those attributes which the test purports to measure is included in Appendix D.

The test consists of a number of questions based on a variety of familiar situations to which alternative answers are provided. The examinee

⁴E. Spanger, Types of Men, translated by Paul J. W. Pigors in Lebensformen (New York: Stechert-Hafuer, Inc., date unknown).

records his preferences numerically and the results are added to determine his relative interest in the six values.

One split-half reliability test of sample size 100 and two test-retest reliability tests of sample sizes 34 and 53 are reported in the test manual with the following results:⁵

<u>Test</u>	<u>Reliability Coefficient Range for Six Values</u>	<u>Mean</u>
Split-Halves (N = 100)	.84 to .95	.90
Test-Retest (1 Mo. interval, N = 34)	.77 to .91	.89
Test-Retest (2 Mo. interval, N = 53)	.84 to .93	.88

The test is essentially self-administering and requires about 20 minutes to complete. Of the five Management Curriculum sections, three completed the test during regularly scheduled class periods and the other two sections completed it outside of class.

IV. LOCAL QUESTIONNAIRE

This is an eight question multiple choice questionnaire which was designed by the authors of this paper. A copy of the questions along with a bar graph of the results is included in Appendix E. An attempt was made to structure the questionnaire so that the answers progressed from the higher to the lower motivational level; i.e., the first answer is intended to indicate the highest student motivation and the last answer the lowest student motivation for the Management Curriculum.

⁵Gordon W. Allport, Phillip E. Vernon, and Gardner Lindzey, Study of Values-Manual, Boston: Houghlin Mifflin Company, (1960), pp. 4-5.

CHAPTER III
METHODS, TECHNIQUES, AND PROCEDURES

I. GENERAL

All 99 officer students of the 1964 Management Curriculum constituted the respondents for this study. The pertinent characteristics of the members of the class are listed in Table I. There were no significant differences between the constitution of the 1962, 1963, and 1964 Management classes.

TABLE I

MANAGEMENT CURRICULUM STUDENT RANKS, DESIGNATORS, AND MILITARY COMPONENTS

<u>Rank/Designator</u>	<u>CDR/LCOL</u>	<u>LCDR</u>	<u>LT</u>	<u>TOTAL</u>
Line (1100)	13	12	10	35
Line (1310-1350) Aviation	11	11	3	25
Line (1510-1515) (WEDO)		2		2
Line (1610) Communications	1			1
Supply (3100)	5	14	3	22
CEC (5100)	1	1	3	5
MSC (2300)			4	4
USMC	1			1
USCG		3	1	4
	<u>32</u>	<u>43</u>	<u>24</u>	<u>99</u>

The basic data used in the study includes the scores obtained from academic grades and the aptitude and personality tests previously described.

The academic grades, QPRs, and GRE and personality test scores are listed in Appendixes A and B opposite student identification numbers which were assigned to preserve anonymity. The data listed in Appendixes A and B was punched onto IBM cards for each student, and by means of a computer program this data was used to generate correlation coefficients. Prediction data was calculated by means of regression analysis and plotting of scatter diagrams.

II. CORRELATION ANALYSIS

The data listed in Appendixes A and B was punched onto IBM cards, one for each student, as follows:

QPR Total Score

GRE Average Score

GRE Verbal Score

GRE Quantitative Score

15 Rorschach Variable Scores as listed in Chapter II.*

6 Study of Values Scores as listed in Appendix D.

* All Rorschach scores used were raw data scores.

Statistical comparison of this data was achieved through the Product-Moment Method of linear correlation⁶ as follows:

$$r = \frac{p}{\sigma_x \sigma_y} \quad \text{Correlation between } X \text{ and } Y$$

Where:

$$p = \frac{\sum (XY)}{N} = \frac{\sum(X) \sum(Y)}{N^2} = \text{Product Moment}$$

σ = Standard Deviation

X = Test Score

⁶ Frederick Cecil Mills, Statistical Methods Applied to Economics and Business (New York: H. Holt and Company, 1938), p. 368.

Y = QPR Score

N = 99 (Sample Size)

Arithmetic relationships were programmed for the 1604 Control Data Corporation computer and the desired correlation coefficients, means, variances, and standard deviations thus obtained.

III. CONFIDENCE LIMITS

Confidence limits for the coefficient of correlation of the GRE (A) to QPR were computed from the formula:

Where:
$$\sigma_r = \frac{1 - r^2}{\sqrt{N - 1}}$$

r = Correlation coefficient

N = Sample size (99)

σ_r = Standard error of r

IV. REGRESSION ANALYSIS

Lines of regression and associated standard errors were computed for the purpose of prediction of academic performance based on GRE scores. The lines of regression and associated standard errors were computed from the following formulas:

Line of Regression -
$$Y' = r \frac{\sigma_Y}{\sigma_X} X - r \frac{\sigma_Y}{\sigma_X} \bar{X} + \bar{Y}$$

Standard Error
about Line
Of Regression -
$$S_Y = \sigma_Y \sqrt{1 - r^2}$$

Where:

Y' = Predicted QPR based on test score X

r = Correlation coefficient GRE (A) to QPR (.6253)

σ_X = Standard deviation of QPRs (.5464)

σ_x	= Standard deviation of GRE (A)s	(73.306)
\bar{X}	= Mean GRE (A)	(568.990)
\bar{Y}	= Mean QPR (third term)	(1.950)

CHAPTER IV

RESULTS OF THE STUDY

I. GENERAL

As stated initially, this study had two primary purposes. The first was simply to assess the nature of the student population in the Management Curriculum by administering the various personality and aptitude tests described previously. The second (and more practical) objective was to determine whether or not any of the test results could serve as useful predictors of academic success in the Management Curriculum. The results presented in this chapter are organized along the lines of these objectives. First, test results for each test are discussed independently from results on other tests. In the second portion of the chapter, correlations between test results and student performance is discussed. A summary of means and standard deviations for all variables considered is provided at the end of the chapter in Table X.

II. TEST AND QUESTIONNAIRE RESULTS

GRADUATE RECORD EXAMINATION - (GRE)

Table II provides a comparison of mean scores achieved on the two sections of the GRE (verbal section and quantitative section) by Management students from 1962 through 1964. Information regarding national norms is also included for purposes of comparison.

The data in Table II indicates that the mean GRE scores of the last three Management classes have been approximately equal. In addition, it indicates that Management students score significantly above national norms for college seniors on both the verbal and quantitative portions of the GRE.

TABLE II
Mean Scores on GRE

Sample	National Norm**	1962	1963	1964
Sample Size	Large	94	94	99
Test				
GRE (Average)*	49.4	56.2	55.6	56.9
GRE (Verbal)	48.7	52.6	51.7	54.5
GRE (Quantitative)	50.0	59.7	59.5	59.3

* 1/2 (GRE (V) & GRE (Q))

**Score Interpretation Leaflet for Students, Educational Testing Service, Princeton, New Jersey.

STRUCTURED OBJECTIVE RORSCHACH TEST - (SORT)

Results of the SORT are given in Tables III and IV.

Table III is a distribution of how the naval officers in the sample scored on each of the 24 personality traits measured by the SORT. This table permits comparison of the sample with the normative population of the SORT which consisted of over 8000 adults drawn from diverse occupations.⁷

The classifications of High, Above Average, Average, etc., were defined such that the following percentages of the normative population fell into each group:

High	7%
Above Average	23%
Average	40%
Below Average	23%
Low	7%

Since the naval officer sample size was 99, the number of officers scoring in each category (High, Low, etc.) approximates the percentage

⁷ Joics B. Stone, op.cit., pp. 4-10.

in that category. This percentage can then be compared with the normal population percentages listed above. For example, the trait entitled Theoretical shows that nine of the 99 officers scored high, 31 above average, etc.

TABLE III

Distribution of Scores on 24 SORT Personality Traits

n = 99

	High	Above Average	Average	Below Average	Low
Normal Percent	7%	23%	40%	23%	7%
TRAITS*					
Theoretical	9	31	39	19	1
Practical	1	14	62	19	3
Pedantic	2	19	40	34	4
Induction	13	30	36	19	1
Deduction	3	20	61	12	3
Rigidity	3	43	42	10	1
Structuring	24	34	31	6	4
Concentration	11	30	52	6	0
Range	2	25	54	18	0
Human Relationships	4	28	38	27	2
Popular	4	18	49	22	6
Original	1	4	21	53	20
Persistence	3	43	42	10	1
Aggressiveness	16	40	34	8	1
Social Responsibility	3	23	59	12	2
Cooperation	1	10	61	26	1
Tact	0	11	67	21	0
Confidence	5	20	46	23	5
Consistency-Behavior	17	44	31	7	0
Anxiety	4	18	47	24	6
Moodiness	0	12	54	26	7
Impulsiveness	0	6	54	27	12
Flexibility	3	39	54	3	0
Conformity	13	40	34	10	2

*A more detailed description of each personality trait measured by the SORT is contained in Appendix C.

Analysis of the figures in Table III reveals that the naval officers in the sample scored high in Induction, Structuring, Concentration, Aggressiveness, Consistency of Behavior and Conformity. Low scores were in evidence for Impulsiveness, Moodiness and Original Response.

Table IV lists each scoring variable in the SORT and shows the mean score obtained by the naval officers in the sample, and mean scores of a large diverse group of adults, and of several selected occupational groups. The occupational groups selected are Industrial Supervisors, Industrial Workers, and Salesmen.

TABLE IV

Mean Scores on 15 SORT Scoring Variables

Variable	Composite* Population	Naval Officers	Industrial* Supervisors	Industrial* Workers	Salesmen*
Sample Size	n = 5024	n = 99	n = 539	n = 1412	n = 140
W	31.85	36.62	36.00	30.41	32.55
D	53.66	54.53	54.14	52.73	54.20
Dd	12.80	11.68	9.64	13.62	12.35
S	12.41	13.32	12.41	12.17	11.00
F	27.26	29.42	30.32	27.38	26.00
F-	13.32	11.40	10.64	14.65	12.25
M	8.61	9.55	9.09	8.54	7.83
FM	10.54	11.17	11.26	10.59	9.88
FC	12.72	13.51	12.55	11.41	12.75
CF	7.95	68.69	7.14	8.49	8.75
Fch	16.54	17.81	15.00	16.41	18.68
A	33.15	32.81	31.25	34.76	27.98
H	21.92	21.14	24.60	21.92	19.98
P	57.15	57.15	57.91	57.84	44.55
O	5.03	5.92	4.37	5.12	4.43

*Data for all columns except naval officers obtained from SORT Test Manual.

A comparison of the scores in Table IV indicates that the average response of the 99 naval officers corresponds quite closely with the average response of industrial supervisors. For example, both naval officers and industrial supervisors are significantly above the composite average in

whole blot (W) responses, Form (F), and Form Movement (FM) responses. On the other hand, both groups are below average in categories for Small Detail (Dd), Poor Form (F-) and Poor Form-Color (CF). Similar comparisons with the other occupational groups show that naval officer responses differ markedly from those of industrial workers and salesmen.

The comparison of the naval officer sample with other occupational groups is not in itself particularly useful. This comparison does give considerable insight into the operation of the SORT, however, and provides a better basis for interpreting scores. Common sense would probably lead one to believe that in their jobs, naval officers are more akin to industrial supervisors than to either industrial workers or salesmen. Test results which coincide with this assessment indicate that the SORT is capable of separating people into groups with meaningful characteristics from a practical viewpoint. This comparison also points up the possibility of using the SORT as a vocational guidance and/or selection tool.

The comparison with the industrial supervisor group tends to temper the results of Table III regarding naval officers. When compared with supervisors, the high naval officer scores for Aggressiveness, Structured Thought, Conformity, etc., do not seem particularly extreme. Apparently there is some tendency for college graduates to exhibit these characteristics, and a strong tendency for people in supervisory positions to exhibit them.

ALLPORT-VERNON-LINDZEY STUDY OF VALUES (AVL)

Results of the AVL - Study of Values are given in Tables V and VI. Table V is similar to Table III for the SORT wherein each interest area is listed and naval officer responses classified into categories of High, Low, etc. Normal population percentages which are listed are different

from those in Table III however.

TABLE V

Distribution of Naval Officer Response to AVL
Study of Values Interest Areas
n = 99

	High	Above Average	Average	Below Average	Low
Normal Percentage	9%	16%	50%	16%	9%
INTEREST AREAS					
Theoretical	2	11	60	20	6
Economic	14	25	46	10	4
Aesthetic	7	16	44	20	7
Social	5	5	45	24	20
Political	19	31	34	11	4
Religious	6	16	53	14	10

Comparative mean scores for the naval officer sample, college males and a group of Air Force officers are listed in Table VI.

TABLE VI

Comparative Mean Scores on AVL Study of Values

	Naval Officers	College Males*	Air Force Officers*
Sample Size	n = 99	n = 5,894	n = 61
INTEREST AREAS			
Theoretical	42.19	43.09	42.72
Economic	45.90	42.05	43.02
Aesthetic	34.52	36.72	35.12
Social	33.62	37.05	35.54
Political	46.52	43.22	46.34
Religious	37.08	37.88	37.26

*Data obtained from Allport-Vernon-Lindzey Study of Values Manual.
Houghlin Mifflin Company, Boston.

The results in Tables V and VI do not reveal any marked differences between naval officers in the sample and the normative population. It should be noted that the AVL was standardized on a group of college students, however, so more homogeneity might be anticipated than in the case of the SORT which was standardized on a more diverse population.

There does appear to be some tendency for naval officers to score high on the Political and Economic scales and low on the Social scale. (A description of interest area titles is contained in Appendix D.) It is also interesting to note the close correspondence between mean scores for naval officers and the sample of 61 Air Force officers.

LOCAL QUESTIONNAIRE

At the end of the first and second terms of the Management course the student QPRs were somewhat lower than those of previous years. In seeking the reason for the lower performance the question of student motivation arose. Consequently, the local questionnaire was promulgated during the third term to obtain a subjective indication of the interest of the Management students in the curriculum.

The results obtained from the local questionnaires of 98 students are depicted on bar graphs in Appendix E. The bar graphs illustrate the following:

- Graph E-1 88 Students requested assignment to the Management Curriculum as first or lesser choice.
- Graph E-2 54 Students found the course at least fairly close to what they expected.
- Graph E-3 57 Students were highly elated to receive orders to the Management Curriculum and only one was disappointed.
- Graph E-4 65 Students probably or definitely would have chosen to remain in the Management Curriculum if they had been given the option of reassignment at the end of the first term.
- Graph E-5 At receipt of orders to the Management Curriculum 80 students considered that completion would enhance their promotion potential.
- Graph E-6 At the time of completion of the local questionnaire only 51 students considered that assignment to the Management Curriculum had enhanced their promotion potential.

Graph E-7 At receipt of orders to the Management Curriculum 82 students considered that completion would greatly enhance their "on the job" performance in the future.

Graph E-8 At completion of the local questionnaire only 65 students considered that assignment to the Management Curriculum would greatly benefit their "on the job" performance in the future.

From these results it appears that the motivation of the current students is generally good. From the shift in distributions between graphs E-5 and E-6 and between E-7 and E-8 it may be inferred that there was a reduction in motivation between order receipt and local questionnaire completion.

III. CORRELATION ANALYSIS

Table VII lists correlation coefficients for all test score variables against the third term QPR. (A complete intercorrelation table of all variables included in the study is included at the end of the chapter in Table XI.)

TABLE VII

Coefficients of Linear Correlation Between 24
Test Scores and Third Term QPRs

Test Score	Coeff. of Correlation	Test Score	Coeff. of Correlation
GRE(A)	.625	Sort CF	.060
GRE(V)	.453	" Fch	-.095
GRE(Q)	.552	" A	-.161
Sort W	-.215	" H	.040
" D	.196	" P	-.039
" Dd	.060	" O	.056
" S	.104	AVL T	.184
" F	.104	" E	-.140
" F-	-.097	" A	.156
" M	.101	" S	-.061
" FM	-.074	" P	-.214
" FC	-.052	" R	.073

As mentioned previously, a correlation coefficient of approximately

.45 or higher is considered necessary if test scores are to be useful for predictive work.⁸ The Graduate Record Exams are the only test scores with correlation coefficients over .45. It does not appear that scores on SORT or AVL factors are by themselves useful for predicting academic success in the Management Curriculum.

CONFIDENCE LIMITS

The 95% confidence limits on correlation coefficients of the GRE scores against third term QPR's are as follows:

TABLE VIII

Confidence Limits GRE/QPR Correlation Coefficients

Test	Correlation Coefficient	95% Confidence Limit	Range of Limits
GRE (Verbal)	.4529	+ .1574	.6103---.3955
GRE (Quantitative)	.5524	+ .1376	.6900---.4148
GRE (Average)	.6253	+ .1206	.7459---.5047

In view of the confidence limits in Table VIII, there can be little doubt but that the GRE score is an excellent predictor of academic success in the Management Curriculum.

REGRESSION ANALYSIS

Having established the GRE as a good predictor of academic success, a line of regression with associated standard error was computed in accordance with the procedure described in Chapter III. This resulted in the following line of regression and standard error about the line:

$$Y = 0.00466X - 0.702$$

$$\text{and } SY = 0.4264$$

Figure 3 page 26 depicts the line of regression of the GRE(A) against the QPR.

⁸ J. P. Guilford, loc cit.

COMPARISON WITH PRIOR YEARS

In their study of the 1963 Management class, Kauder and Ebert computed lines of regression for the 1962 and 1963 classes.⁹ These lines are reproduced herein (with modification of scale) as Figures 1 and 2. (Page 25). Kauder and Ebert noted the very marked shift that took place in the line of regression between 1962 and 1963. This shift has continued and become more pronounced in 1964. Figure 4 (Page 26) provides a comparison of these lines for the past three years.

Kauder and Ebert concluded that the 62/63 shift occurred because the faculty had raised its grading standards in 1963. There can be little doubt but that their conclusion was correct. It is also apparent at this time that grading standards were again raised in 1964. As was pointed out earlier, the GRE scores of the last three classes have been approximately equal and yet the average third term QPR has declined steadily each year. Comparative mean third term QPRs are as follows:

<u>Year</u>		<u>Mean QPR</u>
1962	-	2.33
1963	-	2.17
1964	-	1.95

It appears that the predictive ability of the GRE is improving as the grading standards become more stringent. This is illustrated by the fact that the correlation coefficient between the QPR and GRE has increased in

⁹Robert Kauder and Scott W. Ebert, "An Investigation of the Validity of Certain Aptitude Tests in Predicting Academic Performance in the Navy Management Curriculum at the United States Naval Postgraduate School", (Unpublished Research paper, U. S. Naval Postgraduate School, Monterey, 1963) pp. 26-28.

each of the last three years as indicated below:

<u>Year</u>	<u>Correlation Coefficient</u>
1962	.4839
1963	.5826
1964	.6250

The constantly shifting line of regression makes it difficult to establish a cut-off score on the GRE that could be utilized for selection of applicants for the Management Curriculum. With such a shifting line it is impossible to take a strict statistical approach and predict with confidence that if a cut-off of some certain score were established, a certain percentage of incoming students would attain a QPR of 2.00 or better. Despite this difficulty, the authors believe that a low cut-off on the GRE (probably around 500) could be used to advantage. For example, had such a cut-off been used in 1963 and 1964, the following would have occurred:

TABLE IX

Results of Using a Cut-off Score of 500 on the GRE(A)

	<u>1963</u>	<u>1964</u>
Students eliminated by 500 cut-off on GRE(A)	25	19*
Number eliminated with QPR above 2.00 (3rd term)	9	3
Number eliminated with QPR below 2.00 (3rd term)	16	16*
% of total class below 2.00 before cut	32%	52%
% of total class below 2.00 after cut	07%	41%

*Includes 2 students who dropped out of school prior to the 3rd term.

As may be noted from Table IX, a cut-off of 500 on the GRE (A) would have resulted in dramatic improvement in 1963 academic achievement but also would have eliminated 9 students with QPRs over 2.00. In 1964 only 3 students over 2.00 would have been eliminated, but having 41% of the class still remaining below 2.00 is an unsatisfactory condition. Nevertheless,

LINE OF REGRESSION
 BASED ON 1962 CLASS (n=92)

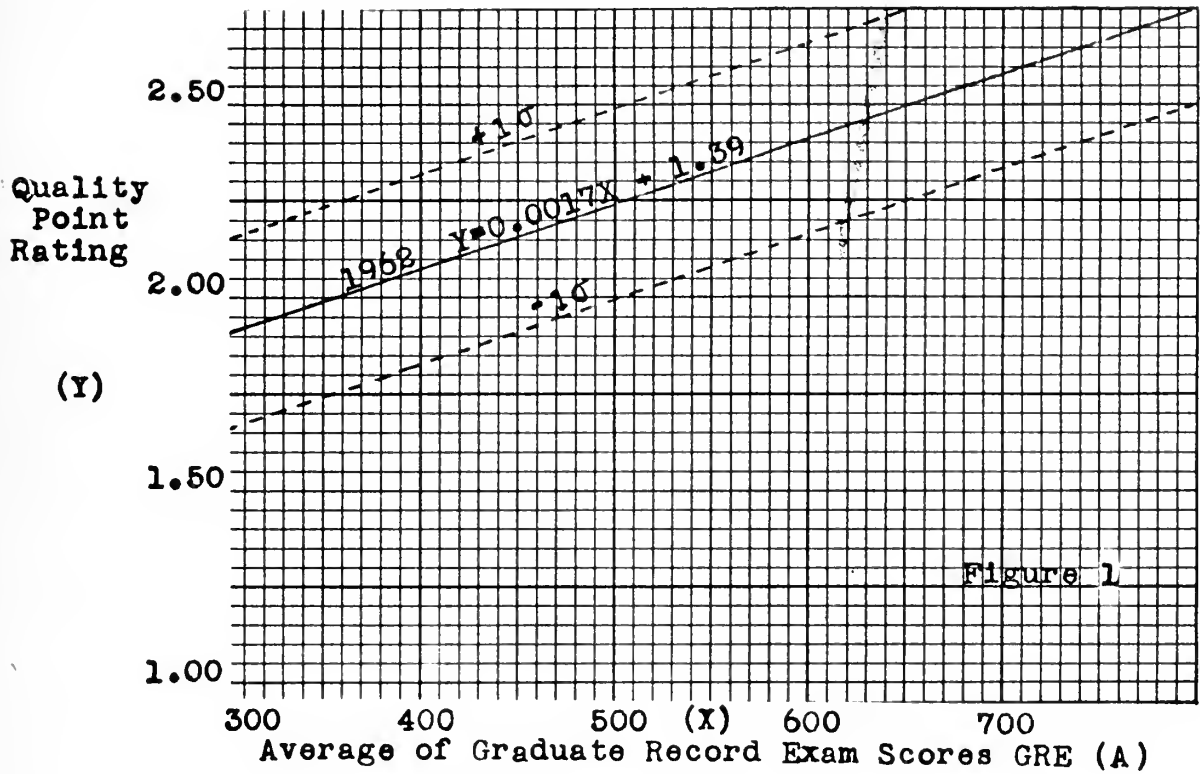


Figure 1

LINE OF REGRESSION

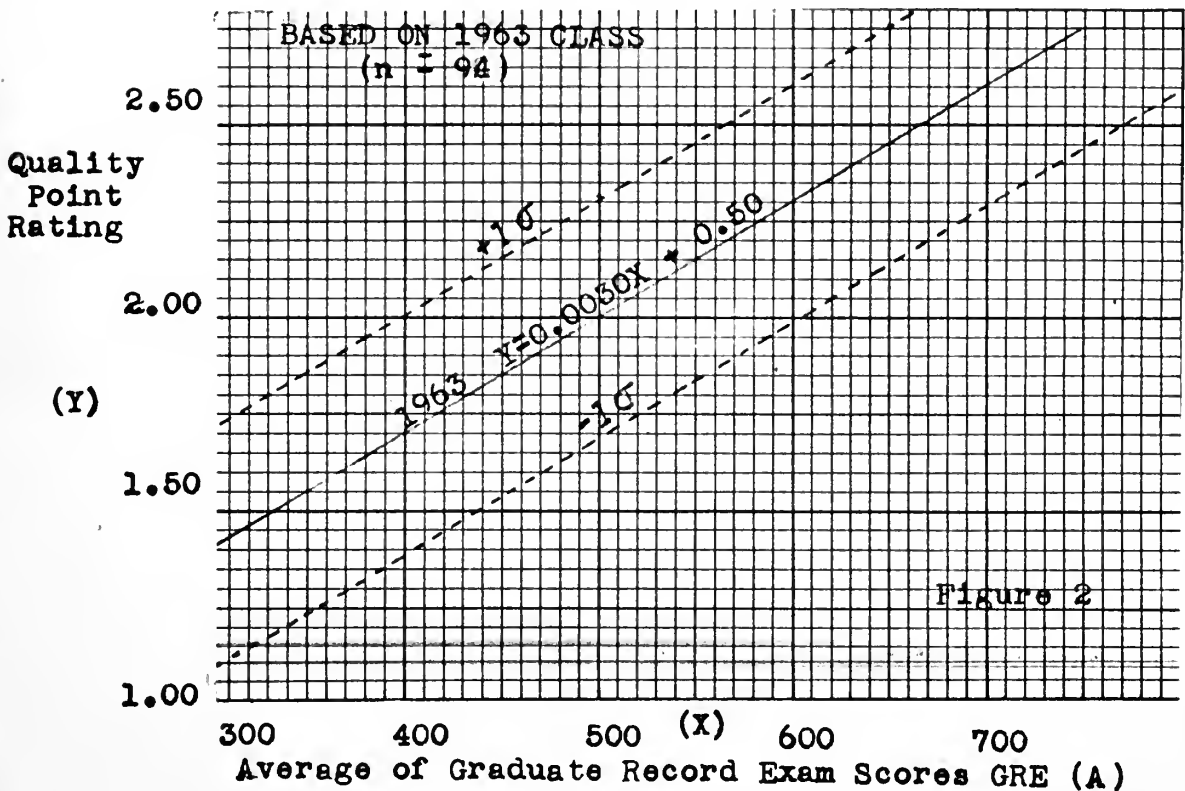
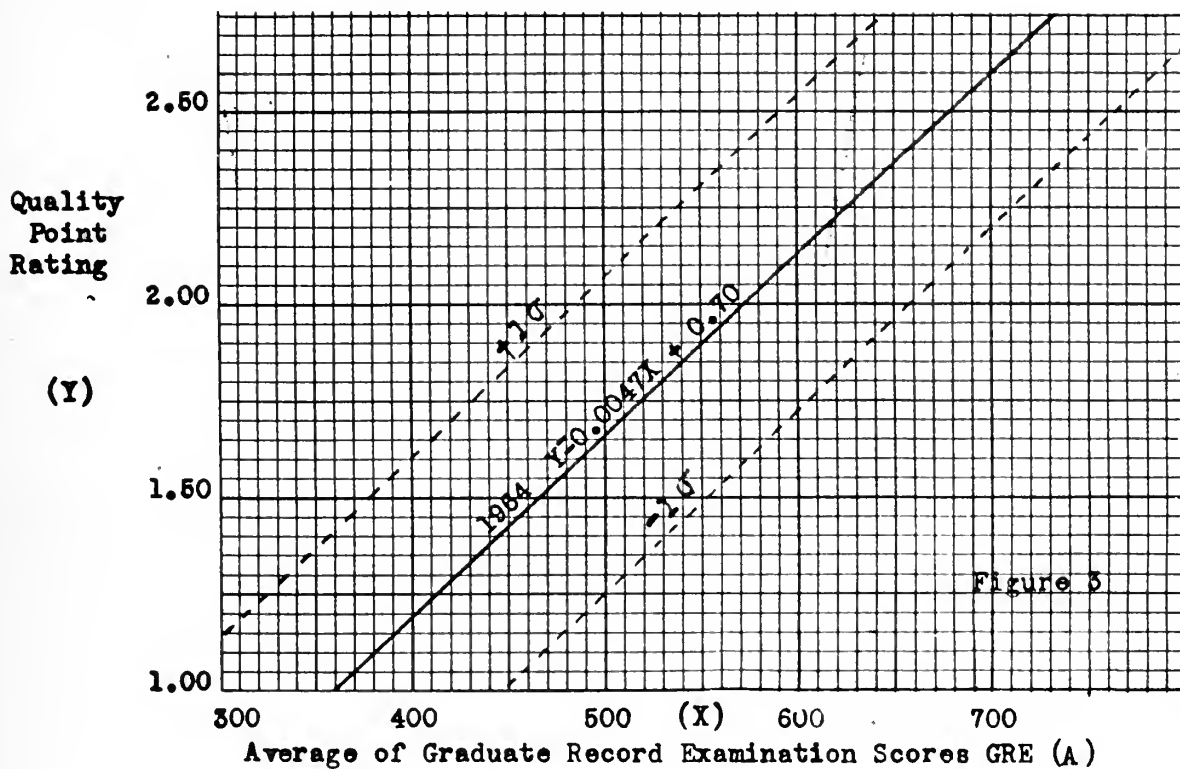


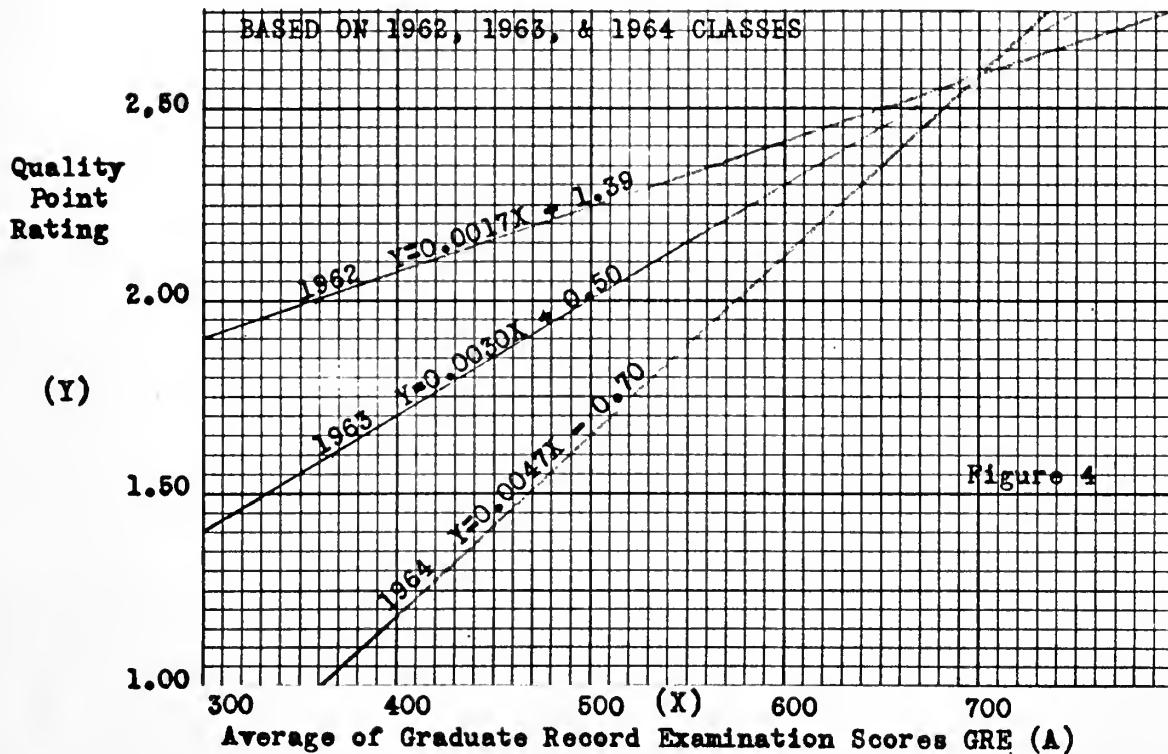
Figure 2



LINE OF REGRESSION
BASED ON 1964 CLASS (n=99)



COMPARISON OF LINES OF REGRESSION



replacing 16 officers with QPRs below 2.00 by 16 other selectees with much higher probability of achieving a satisfactory QPR would still seem to be a highly desirable outcome.

TABLE X

Summary of Means and Standard Deviations
of All Variables Included in the Study
n = 99

Variable	Mean	Standard Deviation
QPR (3rd term)	1.95	0.55
GRE (Average)	56.90	7.33
GRE (Verbal)	54.53	8.78
GRE (Quantitative)	59.33	9.45
SORT W	33.53	5.51
" D	54.53	4.46
" Dd	11.68	3.10
" S	13.32	2.55
" F	29.42	5.50
" F-	11.40	3.02
" M	9.55	3.18
" FM	11.17	2.00
" FC	13.51	2.52
" CF	6.87	2.19
" FCh	17.81	4.21
" A	32.81	4.39
" H	21.14	4.34
" P	57.15	6.48
" O	5.92	2.81
AVL T	42.19	5.91
" E	45.90	7.53
" A	34.52	8.07
" S	33.66	7.55
" P	46.52	7.54
" R	37.08	8.84

TABLE XI

Intercorrelation Coefficients for All Variables Included in the Study

	GRE(A)	GRE(V)	GRE(Q)	W	D	Dd	S	F	F-	M	FM	FC
QPR	.625	.453	.552	-.215	.196	.060	.104	.104	-.097	.101	-.074	-.052
GRE(A)		.784	.823	-.004	.059	-.111	.014	-.039	-.141	.295	-.102	-.104
GRE(V)			.294	.015	-.022	-.034	.010	-.038	-.080	.263	-.118	-.158
GRE(Q)				-.022	.112	-.140	.011	-.020	-.148	.216	-.056	-.028
W					-.815	-.558	.390	-.737	-.199	.164	-.047	.388
D						-.010	.175	.576	.157	-.085	.077	-.148
Dd							.444	.435	.156	-.217	-.030	-.439
S								-.341	.176	-.134	.017	-.236
F									-.106	-.176	-.107	-.386
F-										-.240	-.152	-.114
M											-.094	-.096
FM												.053

	CF	FCh	A	H	P	O	T	E	A	S	P	R
QPR	.060	-.095	-.161	.040	-.039	.056	.184	-.140	.156	-.061	-.214	.073
GRE(A)	.125	-.037	-.427	.120	.040	-.020	.230	-.163	.305	-.146	-.141	-.074
GRE(V)	.116	-.047	-.466	.116	.057	-.050	.133	-.305	.400	-.069	-.078	-.097
GRE(Q)	.100	-.020	-.232	.080	.015	.009	.231	.028	.099	-.166	-.124	-.035
W	.346	.597	-.283	.120	.533	-.463	-.013	.094	-.075	-.092	.028	.022
D	-.296	-.585	.278	-.077	-.296	.357	.016	.035	.064	.045	-.100	-.046
Dd	-.181	-.153	.134	-.128	-.503	.314	-.017	-.157	.011	.107	.076	.017
S	-.324	-.160	.000	-.032	-.101	-.040	.035	-.105	.102	.019	-.050	.023
F	-.482	-.588	.252	-.075	-.434	.313	-.100	-.160	.089	.053	-.042	.135
F-	-.172	-.143	.087	-.256	-.280	.291	.146	-.003	-.059	.063	.110	-.160
M	.039	-.287	-.496	.697	.300	-.111	.095	-.172	.319	.000	-.260	-.008
FM	-.034	-.153	.420	-.010	-.059	-.099	.071	-.016	.033	.086	-.151	-.002
FC	-.061	.106	.184	-.129	.481	-.376	-.060	.086	-.039	.009	-.034	-.000
CF		.252	-.315	-.043	.250	-.170	-.033	.295	.181	-.238	.233	-.055
FCh			-.133	-.141	.163	-.183	-.015	.175	-.238	-.023	.126	-.042
A				-.366	-.160	.086	-.098	.080	-.125	.065	.076	-.014
H					.138	-.011	-.117	-.234	.399	.210	-.300	-.019
P						-.661	.038	.101	-.044	-.191	-.014	.063
O							-.024	-.151	.058	.237	-.202	.076
T								.023	-.107	-.195	-.072	-.383
E									-.500	-.532	.558	-.281
A										.126	-.330	-.208
S											-.448	-.005
P												-.372



CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

I. CONCLUSIONS

A. The Graduate Record Exam is an excellent predictor of academic performance in the Management Curriculum. This conclusion has held for three successive classes under various grading standards.

B. The higher the grading standards, the greater the predictive ability of the GRE.

C. Neither the SORT nor AVL Study of Values are by themselves useful predictors of academic success in the Management Curriculum. The possibility of combining scores on these tests in various combinations or with the GRE to obtain higher correlation than with the GRE alone was not investigated.

II. RECOMMENDATIONS

It is recommended that:

A. The GRE be administered to the candidates for the Management Curriculum.

B. Selection Boards be informed of candidates' scores on the GRE and be advised that applicants with an average GRE score of less than 500 have a low probability of successfully completing the curriculum.



BIBLIOGRAPHY

1. Bandish, Bernard J. "Establishing Valid Criteria for Successful Performance at the Navy Management School." Unpublished Research Paper, United States Naval Postgraduate School, Monterey, California, May, 1961.
2. Edwards, Allen L. Experimental Design in Psychological Research. New York: Holt, Rinehart, and Winston, 1962.
3. Freeman, Frank S. Theory and Practice of Psychological Testing. New York: Henry Holt and Company, 1956.
4. Guilford, J. P. Fundamental Statistics in Psychology and Education. New York and London: McGraw-Hill Book Company, Inc., 1942.
5. Gulliksen, Harold. Theory of Mental Tests. New York: John Wiley and Sons, Inc., 1950.
6. Holtzman, Wayne H., Joseph S. Thorpe, Jon D. Swartz, and E. Wayne Herron. Inkblot Perception and Personality. Austin: University of Texas Press, 1961.
7. Kauder, Robert and Scott W. Ebert. "An Investigation of the Validity of Certain Aptitude Tests in Predicting Academic Performance in the Navy Management Curriculum of the United States Naval Postgraduate School." Unpublished Research Paper, Monterey, California, May 1963.
8. Klopfer, Bruno and Helen H. Davidson. The Rorschach Technique. New York: Harcourt, Brace and World, Inc., 1962.
9. Klopfer, Bruno and others. Developments in the Rorschach Technique. Tarrytown New York: World Book Company, 1956.
10. Krech, David and Richard S. Crutchfield. Basic Psychology. New York: Alfred A. Knopf, 1961.
11. Martz, David J. and Thomas E. Rushin. "Valid Criteria for Selecting Postgraduate Management School Candidates on the Basis of Established Academic Performance and Various Aptitude Tests." Unpublished Research Paper, United States Naval Postgraduate School, Monterey, California, May 1962.
12. Mills, Frederick Cecil. Statistical Methods Applied to Economics and Business. New York: Henry Holt and Company, 1939.
13. Molish, Herman B. "The Rorschach Test in Military Psychology and Psychiatry," American Journal of Orthopsychiatry Vol. 26, 1956, pp. 807-816.

14. Rickers-Ovsiankina, Maria A. (ed.). Rorschach Psychology. New York: John Wiley and Sons, Inc., 1960.
15. Sherman, Murray H. (ed.) A Rorschach Reader. New York. International University Press, Inc., 1960.

APPENDICES

Student ID Number	Quantitative Subjects				Verbal Subjects										GRE			QPR							
	Financial Mgmt. I MN-420A (4 hr.)	Quantitative Methods MN-470A (4 hr.)	Quantitative Methods MN-471A (4 hr.)	Industrial Management MN-470A (4 hr.)	Mgmt. Psychology MN-452A (4 hr.)	Material Mgmt. MN-453A (3 hr.)	Org. Theory & Admin MN-490A (5 hr.)	Mgmt. Economics MN-410A (5 hr.)	Financial Mgmt. II MN-421A (4 hr.)	Economic Analysis MN-413A (3 hr.)	Adv. Cost Accounting MN-432A (3 hr.)	Pers. Admin. (3 hr.) MN-453A (4 hr.)	Procure & Contr. Admin. MN-461A (4 hr.)	Govern. & Business MN-492A (4 hr.)	Organ. & Mgmt. Seminar MN-495A (2 hr.)	Quantitative GRE	Verbal GRE	Average GRE	Total GRE	Quantitative QPR	Verbal QPR	Total QPR			
01 C	D	C	B	A	B	B	C	C										540	390	540	465	930	1.00	2.09	1.73
02 B	B	B	B	B	A	B	B	B											590	560	575	1150	2.00	2.40	2.27
03 C	A	A	B	B	B	B	C	C										540	2.23	620	595	1190	2.25	2.22	2.23
04 A	A	A	A	C	B	C	B	B											550	470	510	1020	3.00	1.72	2.15
05 C	C	B	A	A	B	B	B	B											600	760	680	1360	1.50	2.56	2.21
06 B	C	B	B	A	B	B	B	A											2.24	570	600	1200	1.75	2.46	2.24
07 B	D	C	B	A	B	B	B	A											600	480	540	1080	1.25	2.25	1.92
08 C	C	C	B	C	C	B	C	C											490	590	540	1080	1.25	1.74	1.56
09 C	B	A	A	A	A	B	B	B											560	520	540	1080	2.25	2.44	2.38
10 C	B	A	B	C	A	A	A	B											660	590	625	1250	2.00	2.50	2.33



ACADEMIC AND GRADUATE RECORD EXAMINATION SCORES

Student ID Number	Verbal Subjects										GRE			QPR		
	Quantitative Subjects					Verbal Subjects					Average GRE			Quantitative QPR		
11	Financial Mgmt. I MN-420A (4 hr.)	C	B	A	A	Adv. Cost Accounting MN-432A (3 hr.)	A	Pers. Admin. (3 hr.) MN-453A (3 hr.)	A	Procure & Contr. Admin. MN-461A (4 hr.)	520	590	1180	2.00	2.34	2.23
12	Financial Mgmt. II MN-421A (4 hr.)	A	B	A	A	Adv. Cost Accounting MN-432A (3 hr.)	A	Pers. Admin. (3 hr.) MN-453A (3 hr.)	A	Procure & Contr. Admin. MN-461A (4 hr.)	660	660	1320	2.75	2.53	2.60
13	Financial Mgmt. I MN-420A (4 hr.)	A	A	A	A	Adv. Cost Accounting MN-432A (3 hr.)	A	Pers. Admin. (3 hr.) MN-453A (3 hr.)	B	Procure & Contr. Admin. MN-461A (4 hr.)	650	655	1310	2.50	2.50	2.50
14	Financial Mgmt. I MN-420A (4 hr.)	D	D	C	B	Adv. Cost Accounting MN-432A (3 hr.)	C	Pers. Admin. (3 hr.) MN-453A (3 hr.)	C	Procure & Contr. Admin. MN-461A (4 hr.)	460	490	980	.25	.94	.71
15	Financial Mgmt. I MN-420A (4 hr.)	C	C	B	B	Adv. Cost Accounting MN-432A (3 hr.)	A	Pers. Admin. (3 hr.) MN-453A (3 hr.)	B	Procure & Contr. Admin. MN-461A (4 hr.)	560	510	1020	1.25	1.84	1.65
16	Financial Mgmt. I MN-420A (4 hr.)	D	C	C	B	Adv. Cost Accounting MN-432A (3 hr.)	A	Pers. Admin. (3 hr.) MN-453A (3 hr.)	B	Procure & Contr. Admin. MN-461A (4 hr.)	460	480	960	.50	1.72	1.31
17	Financial Mgmt. I MN-420A (4 hr.)	B	B	A	B	Adv. Cost Accounting MN-432A (3 hr.)	A	Pers. Admin. (3 hr.) MN-453A (3 hr.)	B	Procure & Contr. Admin. MN-461A (4 hr.)	500	500	1000	2.25	1.88	2.00
18	Financial Mgmt. I MN-420A (4 hr.)	C	C	B	B	Adv. Cost Accounting MN-432A (3 hr.)	B	Pers. Admin. (3 hr.) MN-453A (3 hr.)	A	Procure & Contr. Admin. MN-461A (4 hr.)	540	550	1100	1.25	1.88	1.67
19	Financial Mgmt. I MN-420A (4 hr.)	B	A	A	B	Adv. Cost Accounting MN-432A (3 hr.)	A	Pers. Admin. (3 hr.) MN-453A (3 hr.)	A	Procure & Contr. Admin. MN-461A (4 hr.)	650	700	1400	2.50	2.70	2.69
20	Financial Mgmt. I MN-420A (4 hr.)	C	D	B	C	Adv. Cost Accounting MN-432A (3 hr.)	B	Pers. Admin. (3 hr.) MN-453A (3 hr.)	C	Procure & Contr. Admin. MN-461A (4 hr.)	590	590	1180	1.00	1.25	1.17

ACADEMIC AND GRADUATE RECORD EXAMINATION SCORES

Student ID Number		Verbal Subjects										GRE			QPR													
		Quantitative Subjects					Verbal Subjects					Total GRE	Average GRE	Verbal GRE	Quantitative GRE	Verbal QPR	Quantitative QPR	Total QPR										
		MN-420A (4 hr.)	MN-470A (4 hr.)	MN-471A (4 hr.)	Industrial Management	Mgmt. Psychology	MN-452A (4 hr.)	MN-453A (4 hr.)	Org. Theory & Admin	Mgmt. Economics	Financial Mgmt. II	Economic Analysis	Adv. Cost Accounting	Pers. Admin. (3 hr.)	MN-453A (4 hr.)	Procure & Contr. Admin.	MN-461A (4 hr.)	Govt. & Business	MN-492A (4 hr.)	Organ. & Mgmt. Seminar	MN-495A (4 hr.)							
21	C	C	B	B	C	B	B	C	C	C				A		A	A	690	570	630	1260	1.50	1.94	1.79				
22	A	B	B	B	A	B	B	B	B	B				A	A	A	B	500	460	480	960	2.25	2.33	2.31				
23	C	A	B	A	C	B	A	C	B	B				A	A	A	A	680	440	560	1120	2.25	2.24	2.24				
24	A	A	A	A	A	B	A	A	B	A	A						A	740	450	595	1190	3.00	2.77	2.85				
25	C	B	B	B	B	C	C	C	B	B				A	A	A		560	540	550	1100	1.75	2.06	1.96				
26	B	C	C	A	B	B	A	B	C	C				C		C	A	690	560	625	1250	1.75	1.88	1.83				
27	B	C	C	A	B	A	B	B	C	B	B			A		B		710	510	610	1220	1.75	2.09	1.98				
28	C	B	B	B	C	B	B	B	B	B	B			A				610	460	535	1070	1.75	2.00	1.92				
29	C	B	B	B	B	B	B	C	C	C				A		B	A	600	630	615	1230	1.75	1.94	1.88				
30	C	C	A	B	B	B	B	B	B	B				A				540	460	500	1000	1.50	2.25	2.00				



ACADEMIC AND GRADUATE RECORD EXAMINATION SCORES

Student ID Number	Verbal Subjects										GRE				QPR			
	Quantitative Subjects	Quantitative Methods	Quantitative Methods	Quantitative Methods	Quantitative Methods	Quantitative Methods	Quantitative Methods	Quantitative Methods	Quantitative Methods	Quantitative Methods	Verbal GRE	Average GRE	Total GRE	Quantitative QPR	Verbal QPR	Total QPR	Verbal QPR	Total QPR
31 A	MN-420A (4 hr.)	MN-470A (4 hr.)	MN-471A (4 hr.)	MN-472A (4 hr.)	MN-473A (4 hr.)	MN-474A (4 hr.)	MN-475A (4 hr.)	MN-476A (4 hr.)	MN-477A (4 hr.)	MN-478A (4 hr.)	720	740	1480	2.50	2.66	2.60	2.66	2.60
32 C	MN-420A (4 hr.)	MN-470A (4 hr.)	MN-471A (4 hr.)	MN-472A (4 hr.)	MN-473A (4 hr.)	MN-474A (4 hr.)	MN-475A (4 hr.)	MN-476A (4 hr.)	MN-477A (4 hr.)	MN-478A (4 hr.)	550	525	1050	1.25	1.75	1.58	1.75	1.58
33 B	MN-420A (4 hr.)	MN-470A (4 hr.)	MN-471A (4 hr.)	MN-472A (4 hr.)	MN-473A (4 hr.)	MN-474A (4 hr.)	MN-475A (4 hr.)	MN-476A (4 hr.)	MN-477A (4 hr.)	MN-478A (4 hr.)	620	570	1140	1.75	1.72	1.73	1.72	1.73
34 C	MN-420A (4 hr.)	MN-470A (4 hr.)	MN-471A (4 hr.)	MN-472A (4 hr.)	MN-473A (4 hr.)	MN-474A (4 hr.)	MN-475A (4 hr.)	MN-476A (4 hr.)	MN-477A (4 hr.)	MN-478A (4 hr.)	670	610	1220	1.00	1.47	1.31	1.47	1.31
35 C	MN-420A (4 hr.)	MN-470A (4 hr.)	MN-471A (4 hr.)	MN-472A (4 hr.)	MN-473A (4 hr.)	MN-474A (4 hr.)	MN-475A (4 hr.)	MN-476A (4 hr.)	MN-477A (4 hr.)	MN-478A (4 hr.)	640	585	1170	1.50	2.09	1.90	2.09	1.90
36 C	MN-420A (4 hr.)	MN-470A (4 hr.)	MN-471A (4 hr.)	MN-472A (4 hr.)	MN-473A (4 hr.)	MN-474A (4 hr.)	MN-475A (4 hr.)	MN-476A (4 hr.)	MN-477A (4 hr.)	MN-478A (4 hr.)	560	660	1310	.50	2.18	1.63	2.18	1.63
37 A	MN-420A (4 hr.)	MN-470A (4 hr.)	MN-471A (4 hr.)	MN-472A (4 hr.)	MN-473A (4 hr.)	MN-474A (4 hr.)	MN-475A (4 hr.)	MN-476A (4 hr.)	MN-477A (4 hr.)	MN-478A (4 hr.)	620	685	1370	2.50	3.00	2.83	3.00	2.83
38 C	MN-420A (4 hr.)	MN-470A (4 hr.)	MN-471A (4 hr.)	MN-472A (4 hr.)	MN-473A (4 hr.)	MN-474A (4 hr.)	MN-475A (4 hr.)	MN-476A (4 hr.)	MN-477A (4 hr.)	MN-478A (4 hr.)	590	545	1090	1.25	1.59	1.48	1.59	1.48
39 B	MN-420A (4 hr.)	MN-470A (4 hr.)	MN-471A (4 hr.)	MN-472A (4 hr.)	MN-473A (4 hr.)	MN-474A (4 hr.)	MN-475A (4 hr.)	MN-476A (4 hr.)	MN-477A (4 hr.)	MN-478A (4 hr.)	440	505	1010	1.50	2.58	2.22	2.58	2.22
40 C	MN-420A (4 hr.)	MN-470A (4 hr.)	MN-471A (4 hr.)	MN-472A (4 hr.)	MN-473A (4 hr.)	MN-474A (4 hr.)	MN-475A (4 hr.)	MN-476A (4 hr.)	MN-477A (4 hr.)	MN-478A (4 hr.)	740	655	1310	1.75	2.19	2.04	2.19	2.04

ACADEMIC AND GRADUATE RECORD EXAMINATION SCORES

Student ID Number	Verbal Subjects																				GRE				QPR		
	Quantitative Subjects					Verbal Subjects															Total GRE	Average GRE	Verbal GRE	Quantitative GRE	Total QPR	Verbal QPR	Quantitative QPR
	Financial Mgmt. I MN-4206 (4 hr.)	Quantitative Methods MN-4706 (4 hr.)	Quantitative Methods MN-471A (4 hr.)	Industrial Management MN-470A (4 hr.)	Mgmt. Psychology MN-472A (4 hr.)	Material Mgmt. MN-463A (3 hr.)	Org. Theory & Admin MN-450A (5 hr.)	Mgmt. Economics MN-470A (5 hr.)	Financial Mgmt. II MN-421A (4 hr.)	Economic Analysis MN-413A (3 hr.)	Adv. Cost Accounting MN-432A (3 hr.)	Pers. Admin. MN-453A (4 hr.)	Procure. & Contr. MN-461A (4 hr.)	Govern. & Business MN-492A (4 hr.)	Organ. & Mgmt. Seminar MN-495A (4 hr.)	Quantitative GRE	Verbal GRE										
41 B	A	A	B	B	C	C	B	C	A		B										750	590	670	1340	2.50	1.81	2.04
42 D	D	C	B	A	B	D	C	C		A											420	500	460	920	.75	1.91	1.52
43 D	D	C	C	B	C	D	C	D		B											420	620	520	1040	.50	1.06	.88
44 C	F	C	C	C	C	B	C	C		B											400	560	480	960	.50	1.62	1.25
45 D	D	C	C	C	C	D	D	D	B												600	500	550	1100	.50	.81	.71
46 D	D	C	C	C	B	D	D	D		B											470	410	440	880	.50	1.09	.90
47 C	C	B	B	B	B	C	C	B		A											410	610	510	1020	1.50	2.09	1.90
48 D	F	D	C	C	B	B	B	C		A											380	540	460	920	0	2.10	1.40
49 A	B	A	A	A	A	A	A	A		B											670	670	670	1340	2.75	2.60	2.65
50 B	C	D	C	C	D	B	C	B		B											680	590	635	1270	1.00	1.41	1.27



ACADEMIC AND GRADUATE RECORD EXAMINATION SCORES

Student ID Number	Verbal Subjects										GRE			QPR							
	Quantitative Subjects										Verbal GRE			Quantitative QPR							
	MN-420A (4 hr.) Financial Mgmt. I	MN-470A (4 hr.) Quantitative Methods	MN-471A (4 hr.) Industrial Management	MN-472A (4 hr.) Mgmt. Psychology	MN-473A (4 hr.) Material Mgmt.	MN-474A (4 hr.) Org. Theory & Admin	MN-475A (4 hr.) Mgmt. Economics	MN-476A (4 hr.) Financial Mgmt. II	MN-477A (4 hr.) Economic Analysis	MN-478A (4 hr.) Adv. Cost Accounting	MN-479A (3 hr.) Pers. Admin.	MN-480A (3 hr.) Procure & Contr. Admin.	MN-481A (4 hr.) Govern. & Business	MN-482A (4 hr.) Organ. & Mgmt. Seminar	MN-483A (4 hr.) Quantitative GRE	Average GRE	Total GRE	Verbal QPR	Total QPR		
51 C	C	B	C	B	B	C	B			A			A		600	430	515	1030	1.50	2.09	1.90
52 C	C	C	A	B	B	B	B		B				A	A	630	490	560	1120	1.50	2.34	2.06
53 C	C	B	B	B	B	B	C		B				B	A	540	500	520	1040	1.50	2.09	1.90
54 B	C	B	B	C	A	B	B		A				B	B	590	570	580	1160	1.75	2.09	1.98
55 C	C	C	B	C	B	C	C		C				C	A	480	490	485	970	1.25	1.41	1.35
56 B	A	A	B	A	B	B	A		B				B		710	510	610	1220	2.50	2.34	2.40
57 C	D	C	B	C	D	D	C		C				A		570	410	490	980	.50	1.06	.88
58 B	B	C	B	C	A	C	A		A				D		700	540	620	1240	1.75	1.94	1.88
59 B	C	D	B	B	B	B	C		B				A	A	500	630	585	1130	1.25	2.09	1.81
60 A	A	A	A	A	A	A	A		A				A		670	710	690	1380	3.00	3.00	3.00



ACADEMIC AND GRADUATE RECORD EXAMINATION SCORES

Student ID Number	Verbal Subjects										GRE				QPR			
	Quantitative Subjects										Verbal GRE				Quantitative QPR			
	Quantitative Methods										Verbal GRE				Verbal QPR			
	MN-420A (4 hr.)	MN-420A (4 hr.)	MN-420A (4 hr.)	MN-420A (4 hr.)	MN-420A (4 hr.)	MN-420A (4 hr.)	MN-420A (4 hr.)	MN-420A (4 hr.)	MN-420A (4 hr.)	MN-420A (4 hr.)	Quantitative GRE	Average GRE	Total GRE	Total GRE	Verbal QPR	Quantitative QPR	Verbal QPR	Total QPR
61 C	C	C	B	C	C	C	C	C	C	C			490	980	1.25	1.53	1.44	
62 C	D	C	B	C	C	C	C	C	C	C			525	1050	1.00	1.72	1.48	
63 C	D	C	B	C	C	C	C	C	C	C			685	1370	1.00	2.03	1.65	
64 C	C	C	C	C	C	C	C	C	C	C			510	1020	1.50	1.94	1.76	
65 B	C	B	C	C	C	C	C	C	C	C			420	840	2.00	2.16	2.06	
66 A	C	B	C	C	C	C	C	C	C	C			615	1230	2.00	2.29	2.21	
67 C	C	C	C	C	C	C	C	C	C	C			570	1140	1.25	2.12	1.83	
68 B	A	A	A	A	A	A	A	A	A	A			700	1400	2.75	2.90	2.91	
69 A	B	B	B	B	B	B	B	B	B	B			580	1160	2.25	2.60	2.48	
70 B	B	A	B	B	B	B	B	B	B	B			550	1100	2.25	2.31	2.29	



ACADEMIC AND GRADUATE RECORD EXAMINATION SCORES

Student ID Number	Verbal Subjects										GRE			QPR								
	Quantitative Subjects										Verbal GRE			Quantitative QPR								
	MN-4204 (4 hr.) Financial Mgmt. I	MN-4706 (4 hr.) Quantitative Methods	MN-4718 (4 hr.) Quantitative Methods	Industrial Management MN-4714 (4 hr.)	Mgmt. Psychology MN-4704 (4 hr.)	Material Mgmt. MN-4724 (4 hr.)	Org. Theory & Admin MN-4734 (3 hr.)	Mgmt. Economics MN-4904 (5 hr.)	Financial Mgmt. II MN-4214 (5 hr.)	Economic Analysis MN-4134 (4 hr.)	Adv. Cost Accounting MN-4324 (3 hr.)	Pers. Admin. (3 hr.) MN-4534 (4 hr.)	Procure. & Contr. Admin. MN-4614 (4 hr.)	Govern. & Business MN-4924 (4 hr.)	Organ. & Mgmt. Seminar MN-4954 (4 hr.)	Quantitative GRE	Verbal GRE	Average GRE	Total GRE	Quantitative QPR	Verbal QPR	Total QPR
71	A	C	B	A	B	B	B	B	B		A		B		630	620	625	1250	2.25	2.12	2.17	
72	C	C	B	A	B	B	D	B	B	C		A		A		640	460	550	1100	1.75	1.91	1.85
73	A	A	B	A	A	B	B	B	A	A		A			630	480	555	1110	2.75	2.58	2.64	
74	C	C	A	B	B	B	A	C	A		B	B	A		540	390	465	930	1.75	2.24	2.08	
75	B	B	B	A	B	B	A	A	A	B		B		B		540	500	520	1040	2.25	2.48	2.41
76	C	B	B	B	B	B	C	B	C	A		A		A		540	530	535	1070	1.75	2.06	1.96
77	C	C	B	B	C	B	B	A	B		B		A		490	500	495	990	1.50	2.16	1.94	
78	C	D	D	C	B	B	B	C	C		B		B		460	610	535	1070	.50	1.81	1.38	
79	A	B	A	A	B	A	B	B	B	A		A		B		630	630	630	1260	2.75	2.31	2.46
80	C	C	C	C	D	B	C	C	C		B		A		520	390	455	910	1.00	1.44	1.29	

ACADEMIC AND GRADUATE RECORD EXAMINATION SCORES

Student ID Number		Verbal Subjects												GRE			QPR										
		Quantitative Subjects		Verbal Subjects										Average GRE	Total GRE	Quantitative QPR	Verbal QPR	Total QPR									
		Quantitative Methods MN-470A (4 hr)	Quantitative Methods MN-470A (4 hr)	Industrial Management MN-471A (4 hr)	Mgmt. Psychology MN-472A (4 hr)	Material Mgmt. MN-473A (4 hr)	Org. Theory & Admin MN-474A (4 hr)	Mgmt. Economics MN-475A (4 hr)	Financial Mgmt. MN-476A (4 hr)	Economic Analysis MN-477A (4 hr)	Adv. Cost Accounting MN-478A (4 hr)	Pers. Admin. MN-479A (4 hr)	Procure. & Contr. MN-480A (4 hr)	Govt. & Business MN-481A (4 hr)	Organ. & Mgmt. MN-482A (4 hr)	MN-495A (6 hr)											
81	A	B	C	A	A	B	A	A	B			A		B	A		680	610	645	1290	2.25	2.68	2.52				
82	A	D	C	A	B	B	C	A			B			A			540	610	575	1150	1.75	2.19	2.04				
83	B	B	B	A	B	B	A	B			B			A			600	630	615	1230	2.25	2.50	2.42				
84	C	C	C	B	D	C	C	D	D		B			A			530	400	465	930	1.25	1.06	1.13				
85	D	D	D	C	B	B	C	C	D		C			A	B		470	440	455	910	.25	1.47	1.06				
86	B	B	A	B	B	B	B	A	A		A			A			670	470	570	1140	2.25	2.47	2.45				
87	C	D	D	C	A	B	B	A	A		A			A	A		530	520	525	1050	.50	2.76	2.02				
88	C	D	D	C	C	B	D	B	C		B			A	B		540	530	535	1070	.50	1.46	1.14				
89	C	A	B	B	B	B	B	B	A		B						640	420	530	1060	2.00	2.22	2.15				
90	A	A	A	A	A	A	A	A	A		A				A		720	630	675	1350	3.00	3.00	3.00				

ACADEMIC AND GRADUATE RECORD EXAMINATION SCORES

Student ID Number	Verbal Subjects										GRE			QPR		
	Quantitative Subjects										Verbal GRE			Quantitative QPR		
	Verbal GRE										Total GRE			Verbal QPR		
	MN-4204 (4 hr.)	MN-4204 (4 hr.)	MN-4204 (4 hr.)	MN-4204 (4 hr.)	MN-4204 (4 hr.)	MN-4204 (4 hr.)	MN-4204 (4 hr.)	MN-4204 (4 hr.)	MN-4204 (4 hr.)	MN-4204 (4 hr.)	Average GRE	Total GRE	Quantitative GRE	Verbal GRE	Total QPR	Verbal QPR
91	A	A	A	A	A	A	A	A	A	A	730	1460	3.00	2.84	2.90	
92	B	B	B	B	B	B	B	B	B	B	580	1160	1.75	2.53	2.27	
93	A	A	A	A	A	A	A	A	A	A	725	1450	3.00	3.00	3.00	
94	A	B	B	B	B	B	B	B	B	B	590	1180	2.25	2.24	2.24	
95	C	F	D	C	D	C	C	C	C	C	505	1010	.25	1.21	.90	
96	C	C	C	B	B	B	B	B	B	B	610	1220	1.25	2.12	1.88	
97	C	B	B	B	B	B	B	B	B	B	620	1240	2.00	2.11	2.08	
98	C	D	D	C	B	B	C	C	C	C	510	1020	.50	1.69	1.22	
99	A	A	A	A	A	A	A	A	A	A	680	1380	3.00	3.00	3.00	



Rorschach and Study of Values Scores

Structured Objective Rorschach Test (SORT)																Study of Values					
Student ID Number	Whole Blot (W)	Major Details (D)	Minor Details (Dd)	White Space (S)	Form Resemblance (F)	Poor Form Resem. (F-)	Human Movement (M)	Animal Movement (FM)	Color & Form Resem. (FC)	Col.+Poor Fr. Resem. (CF)	Shading (Fch)	Animal Figure (A)	Human Figure (H)	Modal Responses (P)	Rare Responses (O)	Theoretical	Economic	Aesthetic	Social	Political	Religious
01	38	52	10	10	24	14	5	10	15	11	21	33	14	59	6	41	52	23	30	58	36
02	27	58	15	13	37	11	9	10	10	7	16	33	21	59	6	50	50	29	23	49	39
03	26	61	12	17	31	11	7	14	15	6	15	35	15	66	3	53	46	36	25	47	33
04	28	54	18	18	34	11	5	11	13	6	19	35	16	48	6	46	53	27	25	51	38
05	32	56	10	7	27	12	12	8	13	12	15	22	18	56	9	41	40	45	30	49	35
06	21	58	17	15	43	8	9	11	9	6	10	31	21	44	8	34	32	43	31	54	53
07	38	49	13	17	33	11	11	9	14	5	17	37	16	69	3	37	41	34	29	46	53
08	36	52	12	12	25	14	9	11	14	9	18	33	22	61	5	34	48	31	37	51	39
09	30	57	12	13	31	12	11	10	10	7	19	36	23	57	7	49	55	24	25	54	32
10	40	53	7	14	27	13	9	6	15	8	22	26	20	67	5	42	48	25	28	49	48

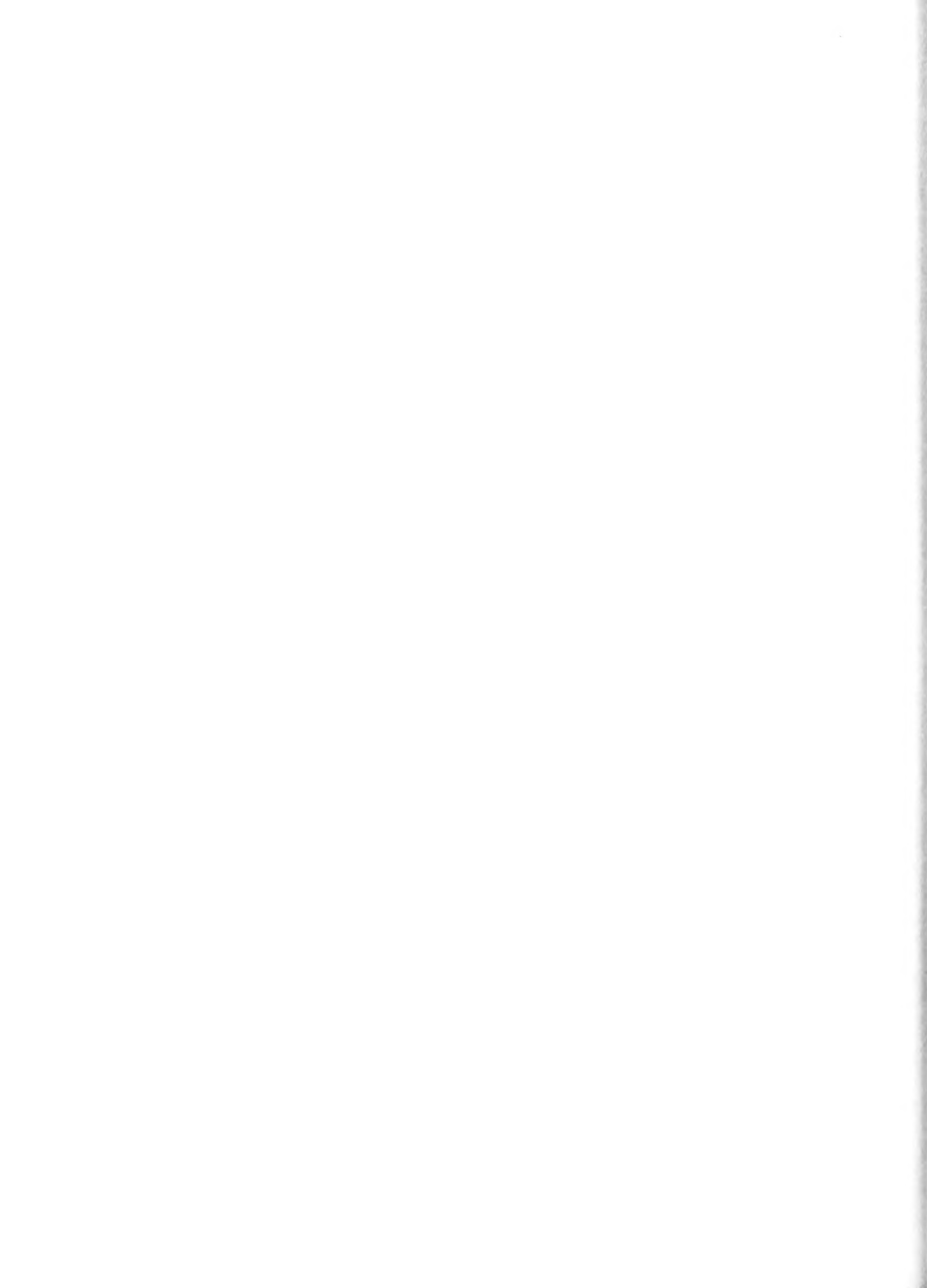
Rorschach and Study of Values Scores

Structured Objective Rorschach Test (SORT)																Study of Values					
Student ID Number	Whole Blot (W)	Major Details (D)	Minor Details (Dd)	White Space (S)	Form Resemblance (F)	Poor Form Resem. (F-)	Human Movement (M)	Animal Movement (FM)	Color & Form Resem. (FC)	Col.+Poor Fr. Resem. (CF)	Shading (Fch)	Animal Figure (A)	Human Figure (H)	Modal Responses (P)	Rare Responses (O)	Theoretical	Economic	Aesthetic	Social	Political	Religious
11	40	54	6	13	24	13	12	9	18	7	17	31	24	68	3	38	52	35	31	50	34
12	33	55	10	11	24	12	15	11	14	8	16	34	25	57	7	39	51	39	30	57	24
13	33	54	12	12	29	8	16	8	16	6	17	27	28	65	3	37	37	50	45	41	30
14	41	51	8	11	29	7	10	12	15	7	20	33	20	71	2	46	51	21	37	50	35
15	38	52	10	12	31	13	10	10	10	5	21	30	25	46	8	33	30	46	37	45	49
16	35	57	8	13	21	11	15	11	18	6	17	28	23	63	5	52	62	22	25	45	34
17	32	57	11	15	38	7	7	14	10	6	18	38	18	56	7	34	49	38	33	37	49
18	34	55	11	15	30	11	6	12	13	7	20	35	14	55	1	39	50	25	31	53	42
19	38	57	5	11	20	12	10	13	19	5	21	39	20	59	6	47	32	38	40	44	39
20	39	52	9	12	26	12	12	12	15	6	17	34	21	63	6	44	51	36	27	43	39



Rorschach and Study of Values Scores

Structured Objective Rorschach Test (SORT)															Study of Values						
Student ID Number	Whole Rolt (W)	Major Details (D)	Minor Details (Dd)	White Space (S)	Form Resemblance (F)	Poor Form Resem. (F-)	Human Movement (M)	Animal Movement (FM)	Color & Form Resem. (FC)	Col.+Poor Fr. Resem. (CF)	Shading (Fch)	Animal Figure (A)	Human Figure (H)	Modal Responses (P)	Rare Responses (O)	Theoretical	Economic	Aesthetic	Social	Political	Religious
21	37	53	9	11	24	10	13	12	13	9	19	30	24	58	4	39	47	42	25	53	34
22	34	54	12	13	31	8	11	11	15	4	20	29	30	59	5	34	52	29	41	48	36
23	35	52	13	12	31	10	12	10	16	5	16	36	22	59	6	38	37	36	41	37	51
24	36	49	15	15	26	17	1	6	12	7	31	31	11	48	8	47½	62½	27½	30½	59½	17½
25	37	52	11	10	25	15	13	11	13	8	15	31	23	60	8	37	51	29	34	44	45
26	29	63	8	15	36	14	10	9	12	5	14	33	24	58	7	39	44	45	42	34	35
27	28	55	17	18	32	8	15	13	11	6	15	30	26	56	4	40	49	31	34	48	38
28	28	62	10	14	37	11	7	10	17	4	13	40	15	52	8	44	48	37	28	45	38
29	40	50	8	11	22	9	10	11	15	7	25	33	23	60	7	41	39	26	37	45	43
30	29	56	14	13	34	7	14	11	11	6	17	30	30	51	10	44	34	42	52	30	38



Rorschach and Study of Values Scores

Structured Objective Rorschach Test (SORT)															Study of Values						
Student ID Number	Whole Blot (W)	Major Details (D)	Minor Details (Dd)	White Space (S)	Form Resemblance (F)	Poor Form Resem. (F-)	Human Movement (M)	Animal Movement (FM)	Color & Form Resem. (FC)	Col.+Poor Fr. Resem. (CF)	Shading (Fch)	Animal Figure (A)	Human Figure (H)	Modal Responses (P)	Rate Responses (O)	Theoretical	Economic	Aesthetic	Social	Political	Religious
31	39	50	11	14	22	13	7	13	13	10	21	33	16	59	4	59	44	41	27	42	27
32	32	58	10	12	30	15	10	13	14	4	14	37	25	56	9	48	33	48	42	39	30
33	32	53	15	17	26	15	14	12	10	7	16	26	24	54	10	43	42	31	31	50	43
34	33	52	15	17	31	10	13	12	9	7	18	27	27	45	7	43	45	49	35	45	23
35	24	67	9	14	38	12	7	10	13	5	15	34	14	52	9	46	56	22	34	46	36
36	38	53	9	17	26	12	11	9	16	4	22	24	27	67	4	41	43	49	39	40	28
37	34	50	16	15	24	14	8	11	13	10	20	26	18	60	2	47	44	47	31	48	23
38	32	54	14	12	30	12	9	12	13	4	20	38	25	56	10	44	31	47	42	36	40
39	30	57	13	16	30	12	8	17	12	5	16	42	22	49	6	39	39	45	49	31	37
40	46	47	7	9	26	8	9	10	13	7	26	27	27	58	6	38	54	39	21	45	43



Rorschach and Study of Values Scores

Structured Objective Rorschach Test (SORT)															Study of Values						
Student ID Number	Whole Blot (W)	Major Details (D)	Minor Details (DD)	White Space (S)	Form Resemblance (F)	Poor Form Resem. (F-)	Human Movement (M)	Animal Movement (FM)	Color & Form Resem. (FC)	Col.+Poor Fr. Resem. (CF)	Shading (Fch)	Animal Figure (A)	Human Figure (H)	Modal Responses (P)	Rare Responses (O)	Theoretical	Economic	Aesthetic	Social	Political	Religious
41	25	60	14	15	37	13	8	11	12	5	14	31	24	48	6	44	34	46	51	40	25
42	30	57	12	13	39	10	9	13	17	3	8	35	19	59	4	51	38	37	34	56	24
43	39	48	13	11	25	9	13	9	10	9	19	29	23	62	7	33	45	41	36	48	37
44	24	56	20	13	28	22	7	10	7	6	20	36	15	41	12	52	48	25	32	57	26
45	34	60	6	7	29	10	16	12	14	9	10	31	26	64	3	42	59	30	29	52	28
46	44	43	13	10	26	9	12	11	13	8	21	32	27	53	5	45	57	31	28	48	31
47	30	53	17	15	32	13	9	8	15	5	18	35	24	53	7	38	31	40	51	39	40
48	40	53	7	12	26	9	7	11	16	9	22	31	19	57	3	34	44	33	29	61	38
49	31	58	11	16	37	12	7	10	17	4	12	33	14	58	7	41	36	37	34	47	45
50	44	49	7	10	16	13	12	13	14	10	22	26	23	62	2	46	48	22	36	51	37

Rorschach and Study of Values Scores

Structured Objective Rorschach Test (SORT)															Study of Values						
Student ID Number	Whole Blot (W)	Major Details (D)	Minor Details (Dd)	White Space (S)	Form Resemblance (F)	Poor Form Resem. (F-)	Human Movement (M)	Animal Movement (FM)	Color & Form Resem. (FC)	Col.+Poor Fr. Resem. (CF)	Shading (Fch)	Animal Figure (A)	Human Figure (H)	Modal Responses (P)	Rate Responses (O)	Theoretical	Economic	Aesthetic	Social	Political	Religious
51	25	63	12	12	29	11	9	10	14	8	20	37	17	60	4	34	58	38	24	51	34
52	41	50	7	13	25	12	12	13	11	7	19	28	28	58	3	52	36	25	45	37	45
53	35	56	10	10	30	15	11	9	15	7	13	33	23	60	8	34	44	33	34	40	55
54	26	62	12	15	33	13	7	13	11	6	16	30	23	46	10	27	45	48	29	36	55
55	25	58	17	16	38	9	3	12	10	10	18	36	17	51	10	33	57	22	42	50	36
56	29	57	14	15	31	13	13	11	14	5	13	33	21	50	7	38	48	32	43	47	32
57	39	50	11	9	25	11	7	15	16	8	18	42	9	57	2	46	52	32	32	52	26
58	46	44	10	14	17	6	9	14	17	13	24	27	23	66	2	38	52	28	34	50	38
59	35	53	11	14	31	11	12	8	10	11	16	31	22	66	3	38	43	35	30	66	28
60	33	55	11	9	32	7	17	11	12	7	13	26	29	53	9	56	38	47	29	35	35

Rorschach and Study of Values Scores

Structured Objective Rorschach Test (SORT)															Study of Values						
Student ID Number	Whole Blot (W)	Major Details (D)	Minor Details (Dd)	White Space (S)	Form Resemblance (F)	Poor Form Resem. (F-)	Human Movement (M)	Animal Movement (FM)	Color & Form Resem. (FC)	Col.+Poor Fr. Resem. (CF)	Shading (Fch)	Animal Figure (A)	Human Figure (H)	Model Responses (P)	Rare Responses (O)	Theoretical	Economic	Aesthetic	Social	Political	Religious
61	25	64	11	17	37	12	8	10	10	10	13	35	23	55	12	36	48	26	37	47	46
62	38	51	12	10	27	9	3	11	15	11	24	36	18	53	9	47	53	24	36	52	28
63	34	52	14	16	28	14	9	12	13	6	18	31	22	49	11	33	45	37	29	48	48
64	32	52	16	12	34	13	8	10	14	4	17	34	22	56	8	37	35	30	47	47	44
65	28	57	14	16	31	15	7	13	15	7	13	38	21	60	6	45	54	34	27	46	34
66	25	59	16	14	28	20	10	12	10	5	15	30	18	40	16	50	43	32	55	38	22
67	28	56	14	16	42	16	6	12	13	4	6	41	16	48	6	42	44	38	27	51	38
68	34	56	10	12	32	6	12	10	14	6	20	33	20	65	4	47	56	26	30	26	42
69	31	56	13	12	24	12	8	15	14	8	19	36	16	61	7	42	33	38	33	45	49
70	34	57	9	14	30	10	10	13	13	6	18	38	25	57	5	43	58	29	23	57	30

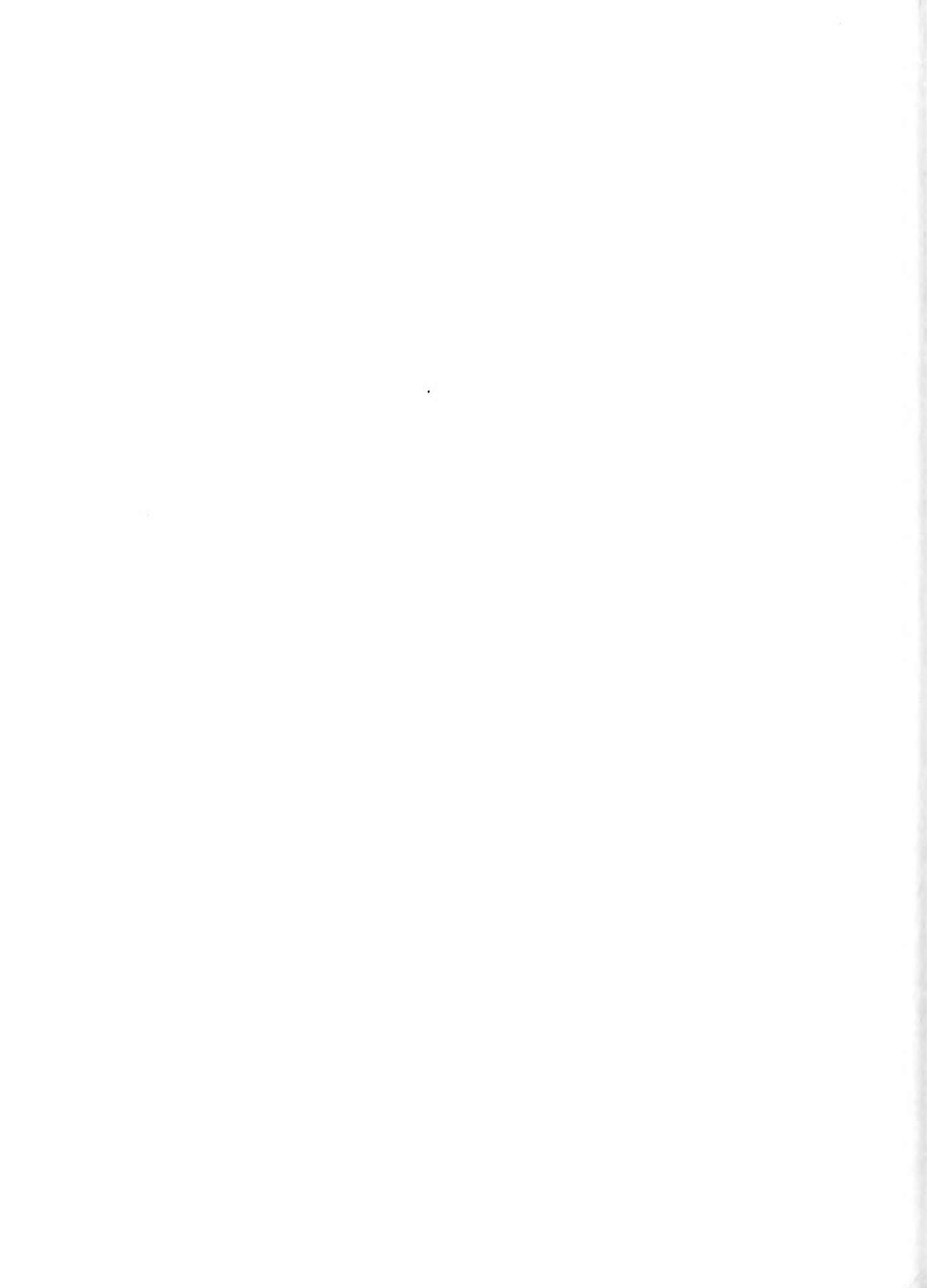
Rorschach and Study of Values Scores

Structured Objective Rorschach Test (SORT)															Study of Values						
Student ID Number	Whole Blot (W)	Major Details (D)	Minor Details (Dd)	White Space (S)	Form Resemblance (F)	Poor Form Resem. (F-)	Human Movement (M)	Animal Movement (FM)	Color & Form Resem. (FC)	Col.+Poor Fr. Resem. (CF)	Shading (Fch)	Animal Figure (A)	Human Figure (H)	Model Responses (P)	Rare Responses (O)	Theoretical	Economic	Aesthetic	Social	Political	Religious
71	28	57	15	18	31	11	13	10	13	10	12	29	25	58	2	47	45	39	31	48	30
72	31	57	10	13	33	11	16	10	13	5	11	29	25	58	6	51	42	31	27	42	46
73	30	60	10	16	27	17	8	12	16	5	15	36	20	57	8	50	50	32	28	45	35
74	44	45	10	13	16	8	11	14	18	9	24	32	20	70	3	41	46	30	37	32	54
75	33	52	15	14	29	15	10	11	15	10	10	31	21	58	6	40	47	39	28	36	50
76	36	58	6	12	23	19	10	11	13	8	15	35	24	61	5	41	54	39	37	49	20
77	31	57	12	16	23	13	5	13	17	7	17	37	23	59	4	39	51	27	41	45	37
78	34	56	10	14	33	10	9	15	14	2	17	36	22	58	5	42	38	45	41	34	40
79	36	50	14	17	29	11	12	10	9	7	22	27	22	64	3	48	44	29	31	43	45
80	34	50	16	10	31	10	4	9	19	5	22	42	18	53	4	26	49	26	38	56	45



Rorschach and Study of Values Scores

Structured Objective Rorschach Test (SORT)																Study of Values					
Student ID Number	Whole Blot (W)	Major Details (D)	Minor Details (Dd)	White Space (S)	Form Resemblance (F)	Poor Form Resem. (F-)	Human Movement (M)	Animal Movement (FM)	Color & Form Resem. (FC)	Col.+Poor Fr.Resem.(CF)	Shading (Fch)	Animal Figure (A)	Human Figure (H)	Modal Responses (P)	Rate Responses (O)	Theoretical	Economic	Aesthetic	Social	Political	Religious
81	26	61	12	15	36	8	7	11	13	5	20	33	16	58	3	42	49	27	31	48	43
82	48	42	10	14	21	9	13	6	16	8	27	21	24	67	3	44	33	45	41	43	34
83	35	52	13	14	29	13	10	12	12	5	19	30	15	50	5	43	51	25	28	54	39
84	35	50	15	13	29	10	6	14	15	5	21	44	21	65	4	40	47	32	32	52	37
85	36	52	12	15	33	13	7	10	8	6	23	34	18	50	5	41	47	24	34	50	44
86	30	60	10	12	31	10	6	11	14	9	19	29	19	54	8	41	50	26	37	36	50
87	31	57	12	13	28	10	10	13	13	6	20	38	28	50	7	40	48	48	34	48	22
88	37	55	8	17	26	11	10	12	17	5	19	34	24	67	1	40	52	50	24	63	11
89	38	55	7	8	19	11	5	12	15	11	27	37	16	59	5	43	42	23	42	53	37
90	24	60	16	16	38	8	13	12	11	6	12	34	29	57	6	40	29	36	41	42	52



Rorschach and Study of Values Scores

Structured Objective Rorschach Test (SORT)																Study of Values					
Student ID Number	Whole Blot (W)	Major Details (D)	Minor Details (Dd)	White Space (S)	Form Resemblance (F)	Poor Form Resem. (F-)	Human Movement (M)	Animal Movement (FM)	Color & Form Resem. (FC)	Col.+Poor Fr. Resem. (CF)	Shading (Fch)	Animal Figure (A)	Human Figure (H)	Modal Responses (P)	Rare Responses (O)	Theoretical	Economic	Aesthetic	Social	Political	Religious
91	41	51	8	13	24	9	14	10	13	11	19	27	25	67	0	48	50	44	18	40	40
92	34	59	7	8	33	11	8	12	17	6	13	36	19	55	6	38	50	36	42	40	34
93	34	54	12	8	29	4	9	14	14	11	19	35	21	52	8	42	57	31	18	55	37
94	37	53	10	13	30	5	11	13	14	8	19	37	21	56	10	43	41	46	46	34	30
95	39	50	11	15	24	13	6	12	16	7	22	33	15	64	4	44	47	28	27	48	46
96	28	58	14	13	4	11	7	6	12	5	19	31	16	48	12	50	49	32	22	54	33
97	30	55	15	15	30	13	11	10	12	6	18	34	25	61	7	50	44	42	24	48	32
98	34	51	15	15	29	16	3	11	16	4	21	35	16	50	4	47	44	26	35	49	39
99	29	55	15	14	40	9	8	13	9	7	13	31	21	57	4	45	42	33	33	60	27

PERSONALITY TRAITS WHICH THE STRUCTURED OBJECTIVE
RORSCHACH TEST (SORT) SEEKS TO MEASURE

General: Scores in Mental Functioning and Temperament factors are expressions of the degree of the factor relative to scores generally distributed in the population. That is, high scores and those above average do not imply a degree that is "good," "bad," "healthy," or "advantageous." A high score simply indicates that the examinee has made more responses than the typical individual to a particular variable. The evaluative interpretation (high or low) depends upon the nature of the factor and its contribution to the individual's life.

MENTAL FUNCTIONING

Intellectual level does not necessarily reflect intellectual performance. It is desirable to know such features as the type of approach to intellectual situations used, adaptability to the reasoning processes, flexibility of ideas, and ability to organize (structure) mental processes.

Theoretical (W): Facility for thinking in broad, general, or abstract terms; facility for getting perspective, visualizing the overall picture, and seeing relationships between the parts.

Practical (D): Tendency for thinking or attacking problems on the basis of practical, concrete, or very definite details.

Pedantic (Dd): Preference for thinking and attacking problems from the standpoint of fine, minute details; tendency to be perfectionistic and to focus on precise, sometimes trivial details.

Induction (W:M): Facility for logical thinking based upon inferences from elements; utilization of their accumulative synthesis to lead to conclusions, principles, or generalizations; ability to organize details into a meaningful whole.

Deduction (D:M): Readiness to employ the logical approach in which established or speculative theories, principles, or generalizations are applied to data or details for the purpose of analyzing their relationships to one another (and to the principle probably involved). A balance between facilities for inductive and deductive thinking, especially when both are high, would point toward a mental adaptiveness or "efficiency" wherein such intellectual potential as the individual has is the more effective because of versatility in logical processes.

Rigidity (S): Tendency toward the dogmatic or toward fixed ideas. Higher scores suggest an unwillingness to change a point of view in spite of evidence to the contrary; low scores suggest an uncritical acceptance of others' viewpoints.

Structuring (F): Facility for mental alertness and precision and exactitude in perception of reality. Occasionally this relates to a somewhat rigid and formalistic way of solving problems, but usually indicates an

awareness of and conformity to the environment and its demands.

Concentration (F-:F): Capacity for attending to the task at hand or for avoiding distractions from one's environment or from one's own extraneous thoughts.

REDUCTIVES

Factors that result in lowering intellectual performance below one's mental potential are called Reductives and are listed below.

Low Generalization (Low W): The Theoretical (W) factor rates so low that attention to principles, perspectives, or theoretical implications is difficult.

Perfectionism (High Dd): The Pedantic (Dd) factor is so extremely high that thought is lost in a welter of preoccupation with minutiae.

Poor Control (High F-): The preponderance of "F-" in the Concentration factor is such that thought is not channeled readily into effective processes.

High Anxiety (High Fch): The Anxiety (Fch) factor is so high that acceptance of one's own conclusions is difficult; as a result, the ability to "think a thing through" is impaired. Excessive worry and feelings of insecurity or incapacity may be dominant.

Compulsivity (High S, F, and D): A combination of the Structuring (F), Rigidity (S), and Pedantic (Dd) factors is of such magnitude that needless repetition, excessive exactness, and unreal conformity result in preventing the full mental processes from proceeding to a logical conclusion.

INTERESTS

These facets of behavior refer to the range of reactions to perceptual experience. Sensitivity to a variety of kinds of percepts implies a broader range of interests than does a paucity of percept-types.

Range (H:P::A): Tendency of interest to be either expansive or to be narrow and confined.

Human Relationships (H): Disposition toward the perception of and attention to elements having human connotations.

RESPONSIVENESS

Two frames of reference are involved here. The first derives from the modality of responses, the second from the frequency of responses. It is assumed that responses to items most frequently seen by the majority of the normative group are indicative of conformity. Conversely, consistent selection of rarely observed items implies a disposition toward uniqueness.

Popular (P): Tendency to perceive the same features in the same way as others; to see things as other persons do; empathic tendencies.

Original (O): Disposition to perceive the unique, the different, and the non-conforming, perhaps even the eccentric; emphasis on individualism, of actions.

TEMPERAMENT

The attributes listed under this heading relate largely to deep inner feeling, for which there often are compensations in outwardly observed behavior. Many of the compensations can become occupational advantages.

Persistence (S): The determination not to deviate from a set course. It may appear as doggedness or stick-to-itiveness. It can range from inability to stick to or complete a task along to the further extreme of stubbornness, defiance, or contentiousness.

Aggressiveness (F:M): The aspiration toward goals by means of well-accepted and morally developed procedures; willingness and desire to work; sense of a mature self-control with social conformity.

Social Responsibility (FC:M): Willingness to subserve oneself, even though no personal gains are evident; energetic acceptance of one's obligations to himself, to his family, and to society.

Cooperation (CF:FC): Willingness to use a teamwork approach; sensitivity toward others in combination with appreciation and responsiveness in human relationships. Willingness to submerge one's immediate needs to the long-range interests of other persons is implied.

Tact (FM:FC:M): Control of impulses and biases; maturity expressed in the ability to maintain a stable relationship with superiors, peers, and inferiors. There is balance between inner impulses, conscious self-control, and demands of the social environment.

Confidence (FM:M): Ego-strength, self-confidence, morale; inner feelings of inferiority to strong feelings of self-assurance. It implies ability to withstand stresses and strains and to maintain feelings of self-worth (prestige) in the face of adversity.

Consistency of Behavior (F::S:Fch): Predictability of actions; tendency for characteristic behavior patterns to be stable and well established.

Anxiety (Fch): Generalized apprehensiveness, uneasiness, or internal disquietude; self-concern and preoccupation with personal well-being, feelings, emotions, and sensations, resulting from a feeling of insecurity. A low anxiety score indicates composure; however, excessive composure, or almost complete absence of anxiety, may indicate a tendency to smother feelings to the point of seeming cold and insensitive. Anxiety may reflect itself in feelings of insecurity, expressions of inadequacy, or restriction of behavior; it may also reflect itself in erratic behavior.

Moodiness (F-:FM::F:M): Sharp fluctuations in mood, ranging from elation to depression. The intensity and duration of either phase may vary greatly.

Activity Potential (M): Control of emotional energy; energy endowment; capacity to follow through on a planned course of action; concentration of energies in a given direction, as opposed to dissipation of strength in non-productive channels.

Impulsiveness (F-:F): Tendency to act upon impulse rather than on the basis of a considered plan; reflected in spur-of-the-moment decisions.

Flexibility (M::FC:CF): Adaptability; faculty for accepting and handling most life situations in a mature manner; capacity to adjust readily from one type of situation to another.

Conformity (O:P): Tendency to accept and be directed by the socially accepted codes, customs, and mores.

SIX BASIC INTERESTS OR MOTIVES IN PERSONALITY
WHICH THE "STUDY OF VALUES" SEEKS TO MEASURE

1. The Theoretical. The dominant interest of the theoretical man is the discovery of truth. In the pursuit of this goal he characteristically takes a "cognitive" attitude, one that looks for identities and differences; one that divests itself of judgments regarding the beauty or utility of objects, and seeks only to observe and to reason. Since the interests of the theoretical man are empirical, critical, and rational, he is necessarily an intellectualist, frequently a scientist or philosopher. His chief aim in life is to order and systematize his knowledge.

2. The Economic. The economic man is characteristically interested in what is useful. Based originally upon the satisfaction of bodily needs (self-preservation), the interest in utilities develops to embrace the practical affairs of the business world -- the production, marketing, and consumption of goods, the elaboration of credit, and the accumulation of tangible wealth. This type is thoroughly "practical" and conforms well to the prevailing stereotype of the average American businessman.

The economic attitude frequently comes into conflict with other values. The economic man wants education to be practical, and regards unapplied knowledge as waste. Great feats of engineering and application result from the demands economic men make upon science. The value of utility likewise conflicts with the aesthetic value, except when art serves commercial ends. In his personal life the economic man is likely to confuse luxury with beauty. In his relations with people he is more likely to be interested in surpassing them in wealth than in dominating them (political attitude) or in serving them (social attitude). In some cases the economic man may be said to make his religion the worship of Mammon. In other instances, however, he may have regard for the traditional God, but inclines to consider Him as the giver of good gifts, of wealth, prosperity, and other tangible blessings.

3. The Aesthetic. The aesthetic man sees his highest value in form and harmony. Each single experience is judged from the standpoint of grace, symmetry, or fitness. He regards life as a procession of events; each single impression is enjoyed for its own sake. He need not be a creative artist, nor need he be effete; he is aesthetic if he but finds his chief interest in the artistic episodes of life.

The aesthetic attitude is, in a sense, diametrically opposed to the theoretical; the former is concerned with the diversity, and the latter with the identities of experience. The aesthetic man either chooses, with Keats, to consider truth as equivalent to beauty, or agrees with Mencken, that "to make a thing charming is a million times more important than to make it true." In the economic sphere the aesthete sees the process of manufacturing, advertising, and trade as a wholesale destruction of the values most important to him. In social affairs he may be said to be interested in persons but not in the welfare of persons; he tends toward individualism and self-sufficiency. Aesthetic people often like the

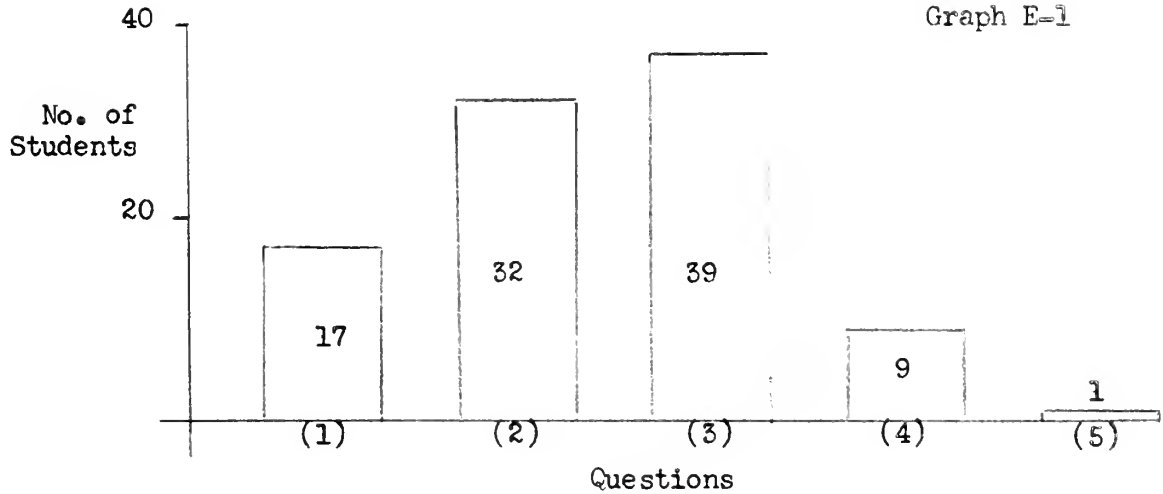
beautiful insignia of pomp and power, but oppose political activity when it makes for the repression of individuality. In the field of religion they are likely to confuse beauty with purer religious experience.

4. The Social. The highest value for this type is love of people. In the "Study of Values" it is the altruistic or philanthropic aspect of love that is measured. The social man prizes other persons as ends, and is therefore himself kind, sympathetic, and unselfish. He is likely to find the theoretical, economic, and aesthetic attitudes cold and inhuman. In contrast to the political type, the social man regards love as itself the only suitable form of human relationship. Spranger adds that in its purest form the social interest is selfless and tends to approach very closely to the religious attitude.

5. The Political. The political man is interested primarily in power. His activities are not necessarily within the narrow field of politics; but whatever his vocation, he betrays himself as a Machtmensch. Leaders in any field generally have high power value. Since competition and struggle play a large part in all life, many philosophers have seen power as the most universal and most fundamental of motives. There are, however, certain personalities in whom the desire for a direct expression of this motive is uppermost, who wish above all else for personal power, influence, and renown.

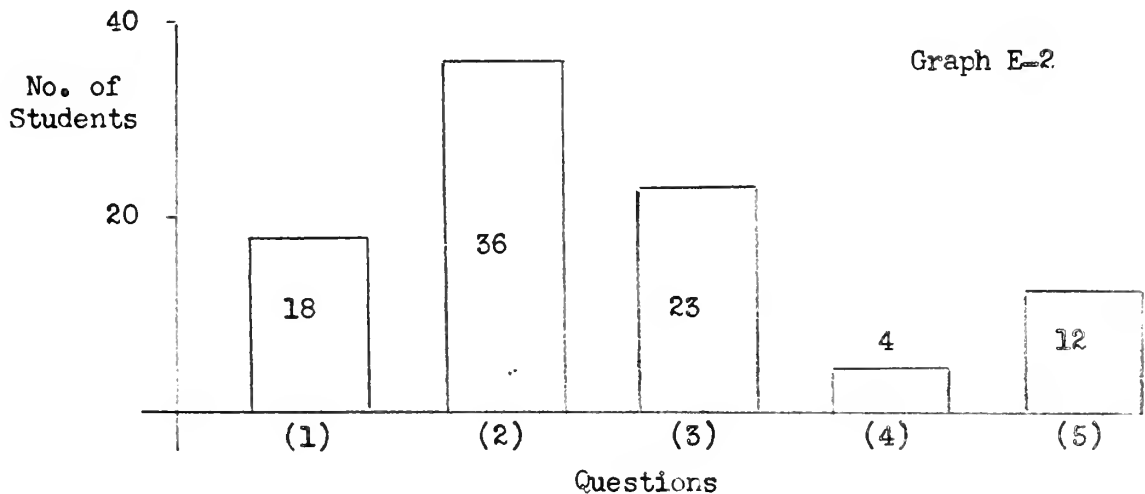
6. The Religious. The highest value of the religious man may be called unity. He is mystical, and seeks to comprehend the cosmos as a whole, to relate himself to its embracing totality. Spranger defines the religious man as one "whose mental structure is permanently directed to the creation of the highest and absolutely satisfying value experience." Some men of this type are "immanent mystics," that is, they find their religious experience in the affirmation of life and in active participation therein. A Faust with his zest and enthusiasm sees something divine in every event. The "transcendental mystic," on the other hand, seeks to unite himself with a higher reality by withdrawing from life; he is the ascetic, and, like the holy men of India, finds the experience of unity through self-denial and meditation. In many individuals the negation and affirmation of life alternate to yield the greatest satisfaction.

LOCAL QUESTIONNAIRE BAR GRAPHS



Q. 1. Did you request assignment to Mgmt Postgraduate School?

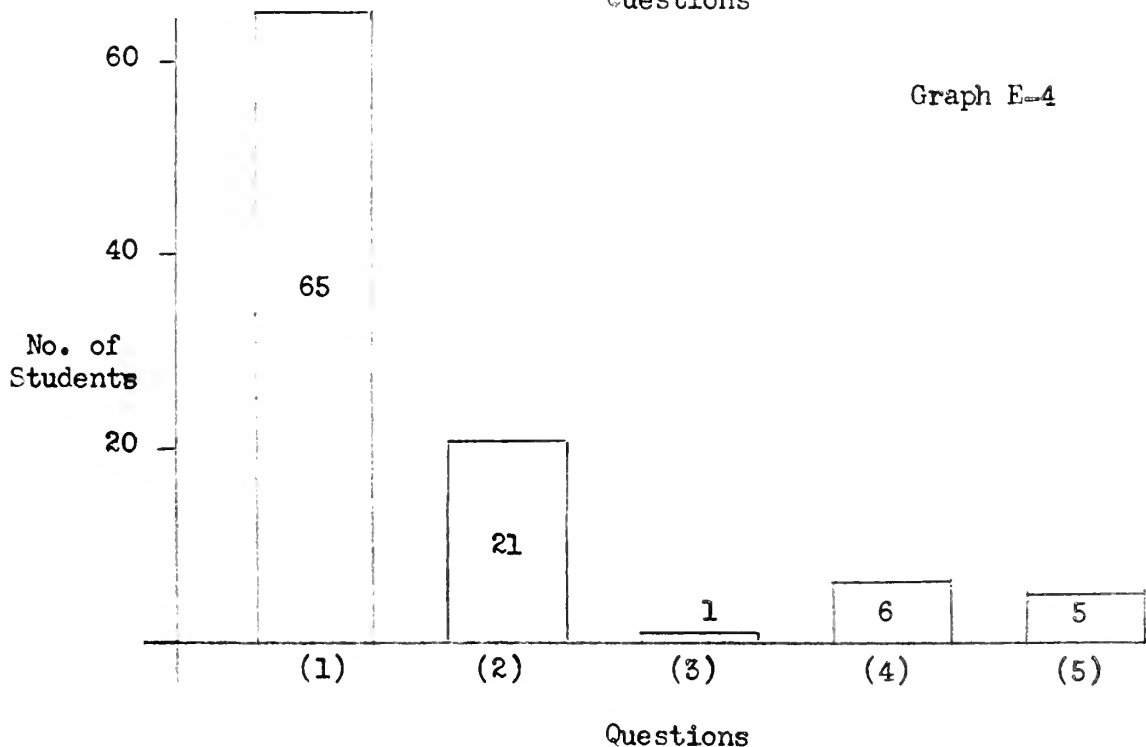
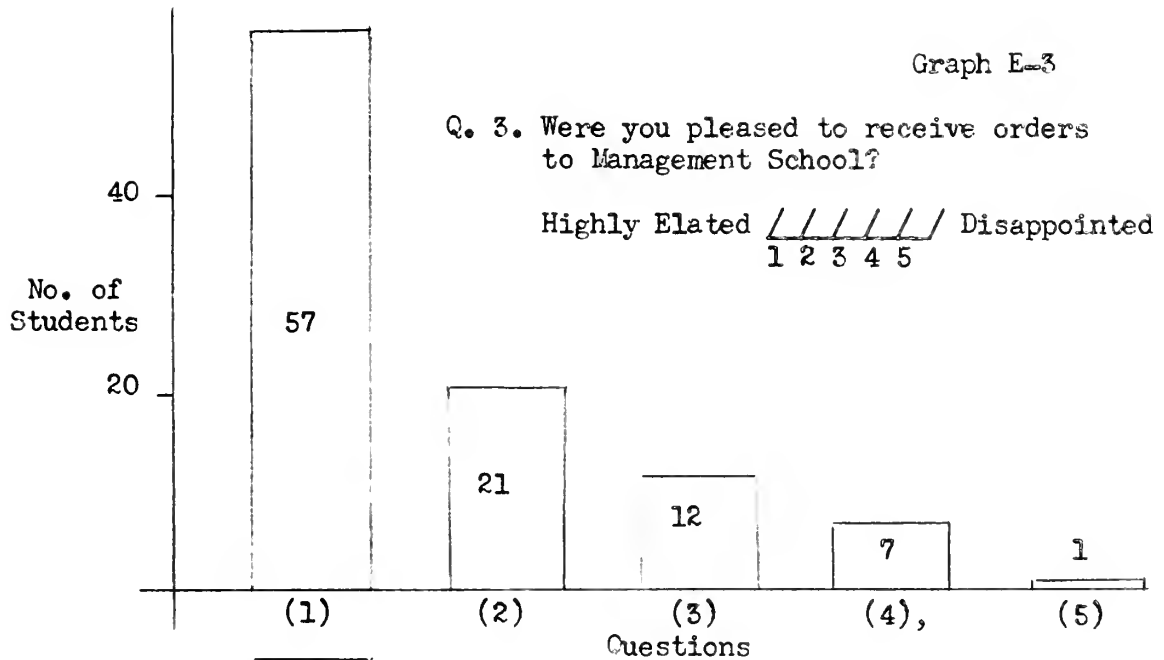
- (1) Yes, as first choice on data card and in addition I contacted my detailer to urge assignment to the School.
- (2) Yes, as first choice on data card.
- (3) Yes, as second or lower choice on data card.
- (4) No
- (5) No, and I made a specific attempt not to be assigned.



Q. 2. Does the course content of the Mgmt curriculum correspond to what you expected at the time you requested assignment?

- (1) Course content is very close to what I expected.
- (2) Course content is fairly close to what I expected.
- (3) Content is considerably different from what I expected.
- (4) Course content is not at all what I expected.
- (5) I didn't know anything about the course when I requested assignment.

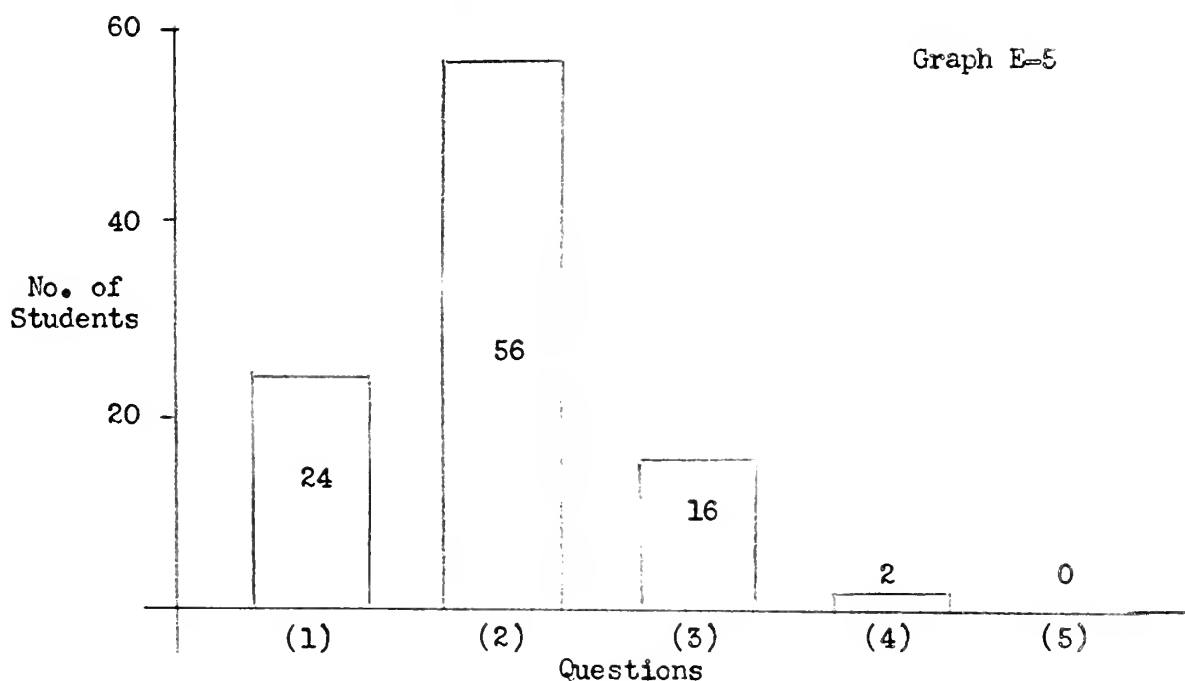
LOCAL QUESTIONNAIRE BAR GRAPHS



Q. 4. If you were given the option at the end of the first term of continuing in the Mgmt curriculum or of being reassigned:

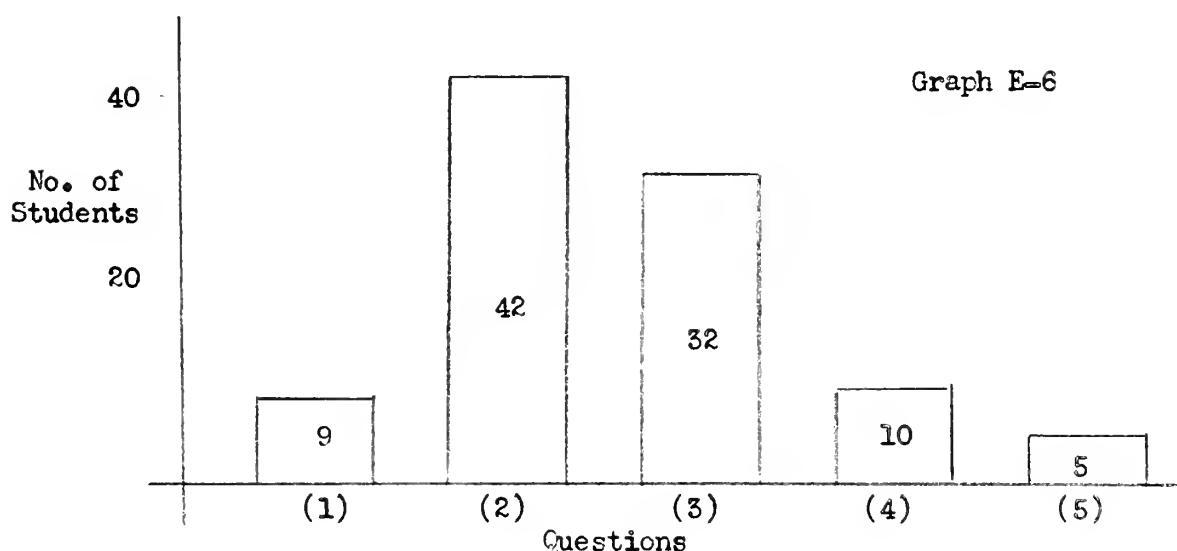
- (1) I would definitely choose to remain in school.
- (2) I would probably choose to remain in Mgmt School.
- (3) I would have been indifferent as to the choice.
- (4) I would probably choose to be reassigned.
- (5) I would definitely choose to be reassigned.

LOCAL QUESTIONNAIRE BAR GRAPHS



Q. 5. At the time you received orders to Management School, did you feel that completion of the school would enhance your promotion potential or be a detriment?

Greatly Enhance / / / / / Be Detrimental
1 2 3 4 5

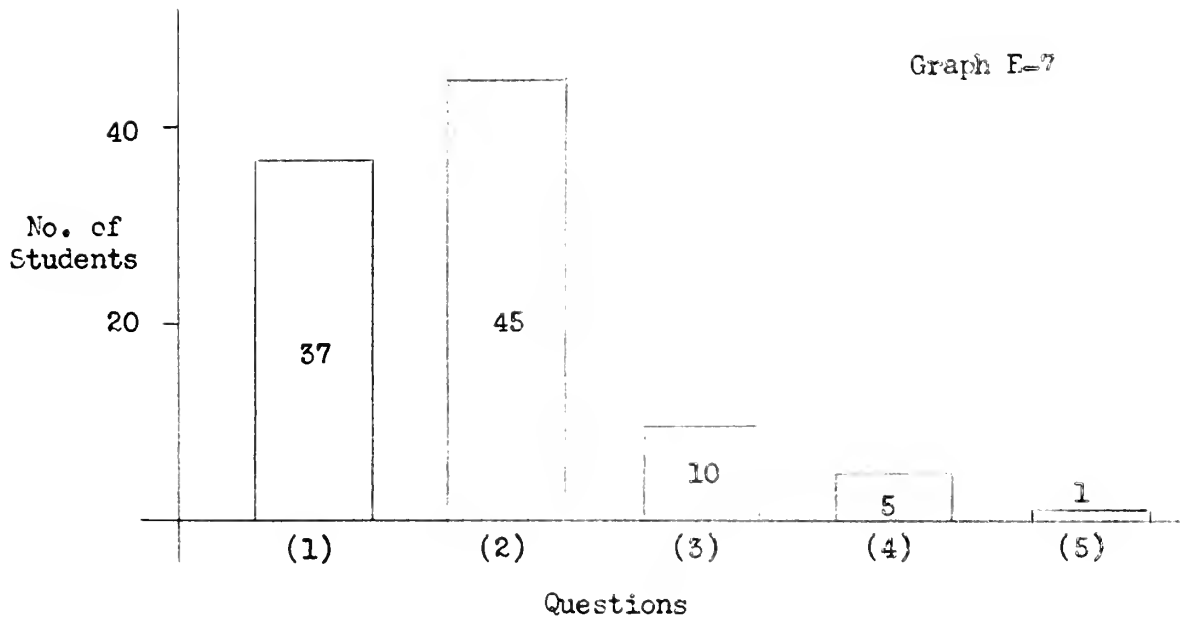


Q. 6. At this time do you feel that assignment to the Mgmt School has enhanced your promotion potential or has been detrimental?

Greatly Enhanced / / / / / Been Detrimental
1 2 3 4 5

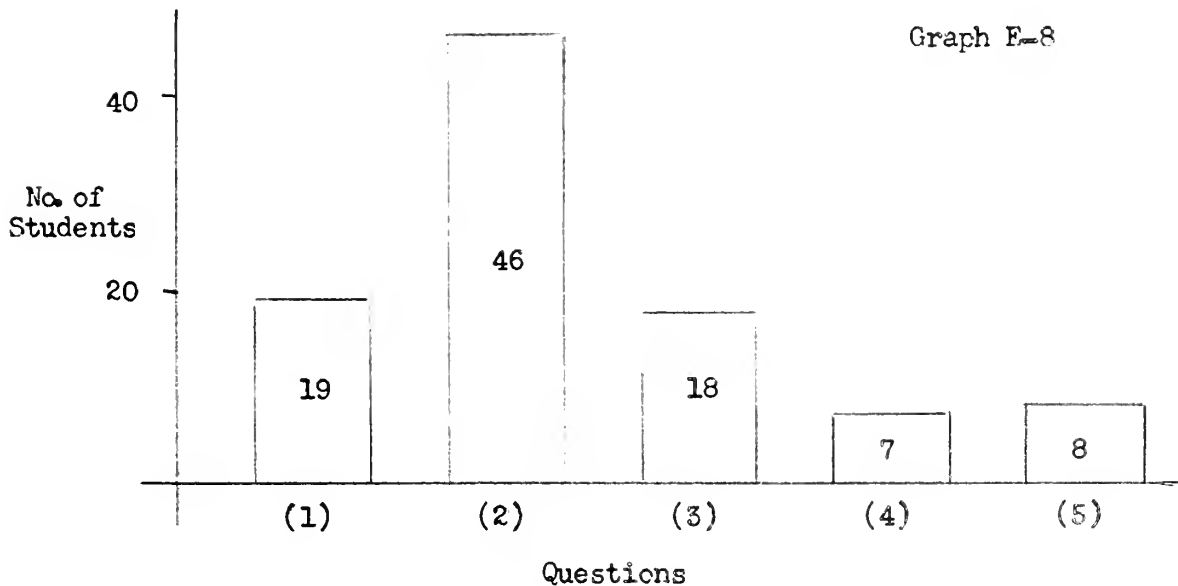
APPENDIX E

LOCAL QUESTIONNAIRE BAR GRAPHS



Q. 7. At the time you received orders to Mgmt School did you feel that completion would benefit your "on the job" performance in future duty assignments?

Be of Great Benefit / / / / / Be of Very
1 2 3 4 5 Little Value



Q. 8. At this time do you feel that attendance at Management School will benefit your "on the job" performance in future duty assignments?

Be of Great Benefit / / / / / Be of Very
1 2 3 4 5 Little Value

As a signification of the validity of the



3 2768 002 00669 4

DUDLEY ENOX LIBRARY